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## **COVER SHEET**

### **synthetic bodies: protocols for intra-acting**

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#### Abstract:

Our bodies are porous entities that interconnect with and depend on the broader collectivity of human and nonhuman life that exists within a shared environment. Using the figuration of synthetic bodies, this exposition aims to examine the relationships in which we are enmeshed as our bodies absorb and excrete chemicals. With a focus on involuntary exposure to industrially manufactured chemicals (as opposed to exposure to naturally occurring chemicals or voluntary experimentation with chemicals of all types), this exposition invites readers to learn about the chemicals to which we are exposed and by which we are affected. With the ubiquity of chemicals in the environment, who are we becoming? How do chemicals affect us and how do we interact with them? How can we live well with chemicals in spite of their potential to harm? Adopting a decolonial feminist, posthumanist, and new materialist approach and embracing queer ecological sensibilities, this exposition develops protocols for embodied and materially embedded research practices that trace the effects of exposure to chemicals in everyday life. In so doing, it aims to demonstrate how we might build resilience through encounters with toxicity, contamination, and impurity.

Keywords:

synthetic bodies, synthetic chemicals, environmental chemicals, environment, posthumanism, new materialism, decolonial feminisms, chemical exposure, toxicity, contamination, impurity, anti-toxic action, feminist technoscience, intra-action, queer ecologies, becoming

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**Page description:** This short introductory page is organized in a linear order from top to bottom.

## synthetic bodies

Synthetic bodies are bodies emerging by synthesis.

Synthetic bodies are ever-changing bodies in the constant process of synthesizing, mixing and remixing, combining and recombining, assembling and reassembling, composing and recomposing, arranging and rearranging, transforming, modifying, mutating, becoming...

**Video description:** *What It Means to Be a Body of Water When This Water Is Increasingly Contaminated*, 2002. Video of body-water intra-actions. Click on <https://www.researchcatalogue.net/view/1609630/2671314#tool-2728806> to watch the video.

Click on this link <https://www.researchcatalogue.net/view/1609630/3070323> to enter.

### *objective*

The goal of this exposition is to introduce readers to the practice of protocolling and inspire them to either adapt these protocols for their research purposes or devise their own.

### *instructions*

Upon entering the main page of the exposition, readers will find access to most of the content directly from this page. Navigation links located at the bottom of each page facilitate easy return to the main page and other key sections of this exposition.

### *acknowledgment*

Designers Day Shift Office (Bára Růžičková & Terezie Štindlová) were invited to infuse the pages of this exposition with digital contaminants. Their subtle intervention aims to extend the contemplation of our synthetic becoming beyond the exposition's content to the act of reading itself. By adding minute traces and residues of digital matter, they prompt readers to reflect on the intricate material entanglements shaping our existence.

Participant information and views are shared here with their consent.

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**Page description:** This short navigation page provides an introduction to the concept of protocols acting as a central page. It allows access to both protocol pages and pages that provide context for these protocols. The content is arranged in a linear order from top to bottom.

## synthetic bodies. protocols for intra-acting

These protocols aim to raise awareness of the extensive reach of our chemical interactions. They promote an embodied and materially embedded approach to understanding chemical exposure, tracing its effects in the sensory experiences of everyday life, and building resilience through encounters with toxicity, contamination, and impurity. The protocols are open-source proposals for collective investigative practices that embrace posthuman mutability and explore our chemical entanglements in ways that foster caring relationships. By doing so, they allow us to envision and enact hopeful futures as we learn to live in a world that includes harmful chemicals.

### *note on consent*

The protocols are designed to unfold within everyday environments, encouraging participants to engage solely with potentially toxic compounds they are already encountering. Instead of exoticizing pollution, the protocols highlight commonplace activities like breathing, drinking water, or touching everyday objects and materials, revealing these ordinary encounters as sites of exchange, transformation, and becoming. Nevertheless, it is crucial to ensure consent at all times.

### **context**

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This accessible page is a derivative of <https://www.researchcatalogue.net/view/1609630/2671413> which it is meant to support and not replace.

**Page description:** This context page explores figurations of material and posthuman feminisms. The content is arranged in a linear order from top to bottom.

## thinking synthetic bodies with other figurations of material/posthuman feminisms

Synthetic bodies are ever-changing bodies in the constant process of synthesizing and [becoming](#). The figuration of synthetic bodies refers to biochemical and chemical synthesis involved in the compositional processes of our bodies. Chemical synthesis performed in a laboratory is a complicated but regulated process of producing new molecules, involving human actors, chemically active substances, chemical reactions, catalysts, protocols, and techniques. The concept of synthetic bodies connects the molecular level of chemical reactions with the macro world of organisms, acknowledging the increasing amount of industrial chemicals involved in the constitution and functioning of our bodies.

The term synthesis originates from the Greek word *σύνθεσις* [synthesis], combining the prefix *syn-*, meaning together, along with, or jointly, and the verb *τίθεναι* [tithenai], meaning to put or to place. In keeping with this original meaning, synthesizing involves combining, composing, mutuality, collectivity, and togetherness. The prefix *syn-*, along with similar prefixes *sym-* and *sy-*, gives rise to expressions that mostly have positive connotations, such as synergy, symbiosis, symmetry, symphony, and sympathy. However, the words syndrome and symptom also share this prefix. In this exposition, I mainly focus on these unwanted and unwelcome manifestations of coexistence with synthetic chemicals produced by capitalist industry. The experience of a synthetic body is thus rich and varied but also painful—a synthetic fusion with the world around us, irreversibly marked by human action.

### synthetic bodies are intra-acting bodies

Feminist theorist [Karen Barad](#) developed the concept of intra-action in their reconceptualization of the conventional notion of interaction. While interaction relies on the existence of pre-established entities that engage with each other, the neologism intra-action signifies the mutual co-constitution of entangled agencies. It is through intra-action that distinct agencies emerge. The boundaries and properties of intra-acting agents become determinate and meaningful through their intra-actions, and these agents are continuously constituted and reconstituted in each intra-action that occurs. Intra-actions constitute the boundaries between humans and nonhumans, and between culture and nature, making it clear that these causal (but nondeterministic) processes need not involve humans. Additionally, we must recognize

that human bodies, like all other bodies, do not possess inherent boundaries and properties but acquire them through the dynamic and open-ended process of intra-activity.

### **synthetic bodies are cyborg bodies**

The figure of the cyborg was introduced by [Donna J. Haraway](#), a multispecies feminist theorist, in her landmark essay *A Cyborg Manifesto*, published in 1985. Her essay sparked a paradigm shift in feminist theory, paving the way for material/posthuman feminisms. The concept of the cyborg challenges static, essentialist notions of identity and dismisses rigid boundaries separating human from animal and human from machine. The cyborg is a hybrid creature—half machine, half biological organism. By collapsing the divide between human and animal, as well as between organism and machine, the cyborg signifies the breakdown of troubling dichotomies perpetuated by Western humanist traditions—namely, those of nature/culture, self/other, mind/body, male/female, civilized/primitive, agent/resource, active/passive, right/wrong, total/partial, and God/man. As a being uncoupled from organic reproduction and the idea of community based on the model of the organic family, the cyborg rejects connections established by genealogical origin in favor of coalitions formed through affinity. The world of cyborgs described by Haraway is a vibrant place populated by cyborg monsters and chimeras, where kin-making replaces reproduction, and cyborgs engage in unruly and unexpected multispecies collaborations and fusions.

### **synthetic bodies are transcorporeal bodies**

Transcorporeality is a concept developed by ecocultural researcher [Stacy Alaimo](#) to acknowledge that all creatures, both human and nonhuman, are entangled with the material world, which in turn crosses through them, transforms them, and is transformed by them. Transcorporeal bodies emerge from this movement across human and nonhuman nature. Transcorporeality dissolves the boundary between humans and the environment, highlighting the environment within us—the environment as the very fabric of ourselves. Transcorporeal subjects are generated from multiple horizontal crossings, transits, and transformations across biological, technological, economic, social, and political processes and systems. Mapping these interchanges across bodies and environments informs transcorporeal ethics and politics, encouraging us to rethink the nature of the permeable surfaces between human bodies, environmental systems, and political action.

### **synthetic bodies are posthuman bodies**

Philosopher and feminist theorist [Rosi Braidotti](#) describes the figure of the posthuman as representing the convergence of posthumanism and postanthropocentrism. The posthuman challenges the centrality of the humanist ideal of Man as the measure of all things and the primacy of *anthropos* as the privileged species. The posthuman subject blurs traditional distinctions between humans and nonhuman others, being no longer a singular, self-governing individual but rather an assemblage of organic matter and technological artifacts. Braidotti develops the concept of the posthuman as a navigational tool to grasp the complexities, challenges, and crises of contemporary existence, marked by accelerated technological development, climate change, environmental degradation, and capitalist extractivism. The

concept of the posthuman calls for the creation of new ways of knowing and being in the world, necessitating the replacement of old systems predicated on hierarchies and sovereign individualities with a more inclusive, all-embracing approach to existence that favors heterogeneous more-than-human multiplicities and transversal convergences.

### **synthetic bodies are bodies of water**

To conceptualize our bodies as watery beings, as hydrofeminist [Astrida Neimanis](#) proposes, is to acknowledge that our existence is situated within myriad relations with other human, nonhuman, and more-than-human bodies. For Neimanis, water, more than any other element, entangles human bodies with more-than-human worlds. Since two-thirds of the human body is composed of water, we inhabit and thrive in watery milieus. In many ways, we are water, and we depend on water for our survival. Examining the philosophical and ethical implications of where our water comes from, where it goes, and what happens to it along the way is key to hydrofeminism—a posthuman feminist phenomenology and ethics that Neimanis develops. Hydrofeminism considers the stakes of the intense interdependency of bodily and planetary waters, investigating what it means to be connected, indebted, and accountable to other planetary bodies of water with which we come into contact. Moreover, it addresses acute planetary water crises, such as clean freshwater scarcity, floods and droughts, groundwater contamination, and ocean acidification, from the perspective of our wet constitution.

### **synthetic bodies are alterlife**

Alterlife is a figuration of chemical exposure developed by technoscience studies scholar [Michelle Murphy](#), focusing on collectivities of chemicalized existence entangled with capitalism and its colonial manifestations. Like other figurations of material/posthuman feminisms, alterlife refers to life beyond the individualized body and responsibility. Drawing from colonial and capitalist pasts and presents, and moving toward differently imagined futures, alterlife encompasses life already altered by the capitalist production, as well as life open to further alterations—life with the potential to become something else. Alterlife embraces impure and contaminated forms of life, affirming their capacity to recompose and recombine within and against infrastructures of violence.

→ [figuring out new figurations using the protocols](#)

This accessible page is a derivative of <https://www.researchcatalogue.net/view/1609630/2671415> which it is meant to support and not replace.

**Page description:** This context page examines the ways in which chemical exposure is made visible or kept invisible. The content is arranged in a linear order from top to bottom.

## **making chemical relations visible/perceptible**

Anthropogenic chemicals have become ubiquitous in the environment, raising significant concerns about the extent of our exposure and its effects on us. How serious is our predicament? How has this exposure altered who we are?

While the nature of chemical exposure makes it challenging to track, it is far from invisible. Instead, we should consider the various practices that make exposure to environmental chemicals and their effects (in)visible.

How, and with what effects, is exposure to chemicals made (in)visible?

## **the science of chemical disruption**

Despite the proliferation of research on environmental chemicals, significant uncertainties remain about the risks posed to human health and wildlife. Because only a small fraction of the hundreds of thousands of synthetic chemicals in existence have been properly assessed, and because many chemicals in consumer products are not identified by the manufacturer, the true extent of the exposure is yet to be revealed.

How many synthetic chemicals are there? Where do they come from? What are the exposures for humans and wildlife? What are their effects, both individually and in mixtures, during development and adulthood, and even across generations? What are their mechanisms of action? These are urgent questions that demand answers. Given the penetrability, mobility, and complex interactivity of chemicals, these problems remain largely unresolved.

Studying chemicals and their effects on human health and wildlife necessitates examining a plurality of interactive factors, including the net effects of chemical mixtures, tissue-specific responses, critical windows of exposure across the lifespan, complex dose–response relationships, and the intricate issues of epigenetic effects, which alter susceptibility to diseases both intra- and inter-generationally. In sum, chemical disruption is a complex, multilayered phenomenon that poses significant challenges, particularly in gathering comprehensive scientific evidence.

## **manufacturing doubt about chemical harms**

The immensely profitable chemical industry is increasingly encroaching upon scientific research. Chemical industry executives hire reputable experts to dispute the findings of independent researchers, [manufacturing doubt](#) about the harms of chemicals. Current legislation requires substantial evidence to ban or restrict chemicals suspected of causing harm, and this skepticism-mongering strategy pays off—chemical companies succeed in questioning the evidential basis of health hazards and ultimately manage to keep their products on the market.

## **chemical regulation**

National and international legislative frameworks for the regulation of chemicals aim to ensure a high level of protection of human health and the environment. Such frameworks are developed and managed by national laws, national and international regulatory agencies, and international initiatives, agreements, and conventions. By defining policy elements, such as exposure or emission limits, and overseeing their enforcement, chemical regulators are just as influential as scientists, if not more so, in determining how the public perceives chemical pollution and its effects on the environment and human health. Under the currently existing neoliberal governance systems, however, regulatory decisions tend to be lax and industry-friendly, facilitating investment and economic growth instead of protecting public health and the environment. More often than not, decisions about the banning of chemical agents for use in industrial production are based on a utilitarian calculation of the potential benefits and harms, which exaggerates the social and economic benefits of toxic chemicals, while downplaying the suspected or known costs in terms of the health of humans, nonhuman organisms, and the environment.

Environmental justice researchers [Reena Shadaan and Michelle Murphy](#) refer to governance systems that justify the continued production of known toxins and acceptable health risks as ‘permission-to-pollute regulatory systems’, highlighting their links to structures of settler colonialism and racial capitalism.

The absence of irrefutable scientific evidence about chemical harms makes chemical regulation contestable. Conceptual frameworks for assessing causality between chemical exposure and adverse health outcomes often enable assessments that result in lax, industry-friendly regulatory decisions. It is challenging to hold chemical companies accountable when only a high probability—rather than a reasonable possibility—of adverse health outcomes warrants regulatory action, and when the evidence bar is set impossibly high relative to applicable scientific methodologies. Moreover, pre-existing structural inequalities are exacerbated when the burden of proof is placed on the victims of pollution rather than the perpetrators.

## **precautionary consumption**

Following uncertainty about the true extent of chemical damage, reinforced by industry-sponsored campaigns of denial and doubt, members of the public are encouraged to take preventive and protective action. Sociologist [Norah MacKendrick](#) introduced the term ‘precautionary consumption’ to describe the practice of reducing personal exposure to the

chemicals found in everyday consumer products by making responsible and informed choices. As MacKendrick demonstrates, precautionary consumption shifts the responsibility for reducing toxic burdens away from manufacturers and distributors and places it upon individuals. However, these individualized tactics fail because chemicals are uncontrollable and infiltrate the environment. Once released from multiple outlets, chemicals circulate through the ground, water, and air, eventually diffusing throughout the entire environment. Thus, a truly effective means of preventing wider exposure to chemicals is infeasible, even through expensive and onerous practices of shielding, filtering, and distancing that MacKendrick elaborates.

Individualized—and largely feminized—tactics for managing environmental toxicities have been critiqued by feminists for spreading the misguided belief that effective protection from ubiquitous chemicals is possible. Moreover, these tactics shift the focus from protecting the environment to protecting ourselves individually, making us less likely to engage in public debates about addressing chemical pollution through systemic changes in chemical manufacturing.

## **environmental activism**

In contrast to the neoliberal approach, which suggests individual avoidance of chemicals, environmental activists advocate for structural changes and accountability on the part of those responsible. International environmental organizations like Greenpeace, World Wildlife Fund, Sierra Club, and Friends of the Earth campaign for a toxic-free future, where hazardous chemicals are no longer produced, used, or dumped into the environment. Environmental activists emphasize the importance of holding chemical industry manufacturers and regulators accountable for the diverse impacts of toxic chemicals, particularly on communities directly affected, and call for decisive action to achieve a global environment free from toxins.

## **eco-normativity**

The advocacy for a toxic-free future, promoting the ban of harmful chemicals and the transition to safe and sustainable alternatives, is underpinned by problematic assumptions. Fantasies about a clean, chemical-free body, environment, and future foster anxieties about impurity, contamination, and pollution and are prone to what [Giovanna Di Chiro](#) terms ‘eco-normativity’—ableist and normative ideas harnessed by environmental discourse to conceptualize exposures and their effects.

This uncritical rhetoric, which labels bodies as ‘impure’, ‘unhealthy’, or ‘unnatural’, becomes particularly problematic in the context of chemicals affecting sexual and reproductive development and functions. Eco-normativity becomes eco-heterosexism once queer bodies and behaviors are put forth as the main evidentiary focus of documenting harms. Both popular media and studies concerned with effects of endocrine-disrupting chemicals on sexual and reproductive systems published in acclaimed scientific journals tend to use normative expressions and catchphrases such as ‘chemical castration’ and ‘gender-bending chemicals’, or describe animal physiology and behaviors as ‘feminized’, ‘homosexual’, or ‘transgender’. In so doing, they make chemical harms visible in ways that promote heterosexist and transphobic views.

## **damage-centered research**

The impact of anthropogenic chemicals on human bodies has been labeled as a form of ‘chemical violence’. The portrayal of chemical violence is essential for developing effective resistance against it. However, the ways in which chemical harms are depicted can themselves become a source of violence. [Eve Tuck](#), an Indigenous studies scholar, introduced the concept of ‘damage-centered research’, which refers to research that focuses on documenting pain, brokenness, and suffering to hold those in power accountable for the oppression they have inflicted. According to Tuck, the possible gains of research that describes people, communities, or environments as ‘toxic’, ‘polluted’, or ‘damaged’ do not warrant the cost of thinking about ourselves or others in reference to these terms. Tuck urges communities, researchers, and educators to reconsider how research is framed and conducted and to rethink how research findings could be used by, for, and with communities.

## **queer ecologies**

Queer ecologies refer to ideas, practices, and sensibilities that acknowledge the richness, diversity, and complexity of the natural world. Pioneered as an interdisciplinary field of inquiry by [Catriona Mortimer-Sandilands and Bruce Erickson](#), queer ecologies oppose generalizing and essentializing interpretations of nature from human assumptions, especially the heterosexist notions of nature that associate ‘natural’ with ‘heterosexual’. Queer ecological approach acknowledges that the effects of chemical substances encompass biochemical as well as sociocultural processes and tensions. Evaluating these effects thus requires critical attention to our complex more-than-human and socio-political relationships, including the pressing issues of informed consent, chemical violence, extractivism, consumerism, and complicity, all of which influence our becoming within the intertwined network of biochemically active molecules and unequal capitalist relations.

By rejecting the politics of purity and affirming polluted, injured, and vulnerable forms of being, queer ecologies recognize the potential of these forms to change and rearrange—to become someone else—together with and in spite of these substances. In this way, queer ecologies offer a critical yet hopeful vision of life with synthetic chemicals, forming an alternative to both normative ideas of ‘healthy’ and ‘clean’ bodies and environments.

## **community resistance**

The burden of pollution is not evenly shared across society. People from lower socioeconomic backgrounds and certain racial and ethnic groups face higher exposure to pollutants and may experience more severe health impacts as a result. Disadvantaged workers suffer the consequences of occupational exposure, while communities located near chemical production and dumping sites are disproportionately affected by pollutants. This is particularly evident in Indigenous communities, where livelihoods depend on resource-rich Indigenous territories.

Policymakers and national or international organizations fail to take action due to a lack of interest or insufficient formal documentation of the damages. As a result, affected communities develop their own strategies to expose the reality of their situation and mitigate the effects of

environmental violence, leveraging community-based resources to create tools and solutions for health protection, assessment, and healing.

## **environmental justice**

Environmental justice plays a crucial role in the endeavor to improve and preserve a clean and healthy environment, particularly for communities of color who have historically been compelled to reside and labor in close proximity to sources of pollution. According to the definition of the [Environmental Justice Movement](#), environmental justice essentially means that everyone—regardless of race, color, national origin, or income—has the right to the same environmental protections and benefits, as well as meaningful involvement in the policies that shape their communities.

In the realm of potentially harmful chemicals, [environmental justice](#) encompasses more than just combating unethical practices in the production, distribution, and disposal of toxic substances. It also involves ensuring an equitable redistribution of waste and toxins that currently exist within our environments. Instead of solely focusing on detoxifying bodies and cleaning up environments (essentially relocating toxicities elsewhere), environmental justice encourages us to confront the challenges directly and willingly accepting some responsibility for managing toxicity by taking some of the burden of toxicity ourselves.

## **decolonial feminist approach**

‘Pollution is colonialism.’ This assertion by plastic pollution researcher and citizen scientist [Max Liboiron](#) forms the foundation of the decolonial feminist approach adopted in this exposition. Building on this basic idea and informed by intersectional perspectives, the decolonial feminist approach seeks a nuanced and layered understanding of the power matrix of overlapping oppressions. It critiques Western capitalist modernity for being not only androcentric, misogynist, and heterosexist but also intrinsically racist and Eurocentric, with ties to coloniality. This approach examines the possibilities of decolonizing uncaring, colonial relations.

To the extent that the normative imaginary of a toxic-free futurity promotes ableist and heterosexist renderings of this future, decolonial feminist research seeks to challenge such conceptualizations, looking to identify and study chemicals in ways that facilitate caring relationships. The goal of [decolonial feminist toxic politics](#) is to shift the understanding of toxicity away from fetishized evidentiary frameworks that focus on misbehaving molecules. Instead, it seeks to interpret toxicity in terms of power dynamics and justice. This approach also aims to diversify and enrich concepts of agency and action, acknowledging the complexities of living in a permanently polluted world.

This exposition aims to strengthen the decolonial feminist frameworks that may be used to understand chemical exposure through the development of the figuration of synthetic bodies and by proposing protocols for embodied and materially embedded research practices that affirm vulnerable and wounded forms of living with, and despite, the potentially harmful chemicals.

→ making chemical relations visible/perceptible using the protocols

This accessible page is a derivative of <https://www.researchcatalogue.net/view/1609630/2671403> which it is meant to support and not replace.

**Page description:** This protocol page invites readers to explore urban dust, encouraging an open-minded approach that goes beyond viewing it solely as a toxic concern. The content is arranged in a linear order from top to bottom.

## **making kin with urban dust. protocol for gathering (with) dust**

This protocol invites participants to learn about and find kinship with urban dust. Dust particles are a ubiquitous presence in urban areas: they are lifted by the wind, they float in the air, and they settle on surfaces. Urban dust contains various chemical contaminants and plays a key role in urban pollution. The inhalation of small dust particles can lead to respiratory and heart problems. Furthermore, dust can cover plants and thus affect their prosperity and growth. The deposition of chemicals and heavy metals can exert toxic effects on plants, animals, and humans. Building on the concept of 'chemical kinship' that has been theorized by interdisciplinary scholars [Angeliki Balayannis and Emma Garnett](#), this protocol probes what finding good kinship with 'bad' dust might involve. The protocol encourages an expansive, open-minded approach that will extend our relationships of care and responsibility to potentially harmful and hazardous material entities. Therefore, it engages with urban particulate matter without reducing it to a toxic object of concern. Rather than adopting such a reductivist approach, the protocol keeps the lines of inquiry open and investigates possibilities for affection and sympathetic action.

**whom** is this protocol for?

The protocol is designed for small to medium groups of participants, ranging from two to twenty-four people.

**what** is required to carry it out?

The protocol takes place outdoors. Participants are asked to come prepared for an urban walk.

**how long** does it take?

The protocol takes approximately two to four hours.

### **instructions**

One of the participants assumes the role of facilitator and briefs others about the protocol and its objectives. In the facilitator role, they provide the other participants with basic information

about urban dust and explain the research task.

Urban dust consists of fine particles of solid matter from various sources. It can be atmospheric or wind-borne dust traveling from such distant places as the Sahara desert, the world's biggest producer of dust. It can come from materials found in the local environment, such as solid particles discharged from vehicles, construction particles, soil minerals, plant pollen, human hair, dead skin, animal fur, or microplastics from degraded textile fibers. Urban dust serves as an important archive of life in industrialized countries. Moreover, it is one of the most informative indicators of the ecological state of urban environments.

Urban dust contains heavy metals and metalloids, polycyclic aromatic hydrocarbons, and endocrine-disrupting chemicals, all of which are often found in environmentally hazardous concentrations. Exposure to these chemicals can lead to health risks including allergic reactions, pneumonia, asthmatic attacks, carcinogenic and mutagenic effects, and endocrine disruption. Dust covering plants and trees hinders their growth and fecundity. The accumulation of dust in the atmosphere may cause light scattering, leading to the changes in the weather patterns and climate.

The protocol takes the form of an urban walkshop (walking workshop). While walking, participants focus on the following:

### **breathing deeply**

Participants are encouraged to breathe deeply, especially when walking down a busy road. They are asked to pay attention to what comes in with each breath and what comes out. What does breathing polluted air feel like? Is it relaxing? Is it irritating? Do participants experience any shortness of breath or difficulty breathing? Do they enjoy breathing this air, or does it make them feel anxious and worried?

### **collecting dust**

During the walk, participants stop to inspect surfaces covered with dust, such as roads, pavement, construction and architectural elements, or the leaves of plants and trees. During their examination, participants touch the surfaces, accumulating an increasingly thick layer of dirt on their hands. What does the dust feel like on the hands? Does it irritate them? Does it produce pleasurable sensations and feelings? Do they enjoy it, or does it make them uncomfortable and anxious?

### **discussing the ways in which dust is encountered in daily life**

Participants engage in discussions about encounters with dust in everyday life, both indoors and outdoors. They explore the material and metaphorical significance of dust in their experiences and surroundings. What are the dust-related material circulations, interactions, and transformations in which participants are involved? What stories and metaphorical uses pertaining to dust do they find relatable?

Ideally, the walk concludes at a location with outdoor water access, such as a beach, riverbank, or a square with a fountain. Alternatively, participants can bring water with them. Participants come together and exchange ideas. They take turns sharing what they learned during the walkshop from breathing, touching dusty surfaces, and talking to one another. The

session ends with participants washing their hands together.

**Image description:** Photograph of participants' dust-covered hands, taken during the walkshop in Brno on November 7, 2022. Click on <https://www.researchcatalogue.net/view/1609630/2671403#tool-2674117> to see the photograph.

follow-up protocol

## **bodies of air**

In this follow-up protocol, participants apply the knowledge gained during the walkshop to delve deeper into their experiences and insights. They engage in theoretical discussions to develop concepts of 'bodies of air', 'aerocommons', and 'aerofeminism'.

**whom** is this protocol for?

This follow-up protocol is for the participants of the walkshop.

**what** is required to carry it out?

The materials required are a whiteboard or large sheets of paper, markers, and tape. If participants decide to stay outdoors, a pen and paper will suffice.

**how long** does it take?

This follow-up protocol takes two to three hours.

## **instructions**

One participant takes on the role of facilitator and introduces the group to concepts of bodies of water, hydrocommons, and hydrofeminism developed by theorist [Astrida Neimanis](#).

### **bodies of water**

For Astrida Neimanis, water, more than any other element, entangles human bodies with more-than-human worlds. With water comprising two-thirds of the human body, we in many ways inhabit watery milieus. We are water, and we depend on water for our survival.

### **hydrocommons**

The term 'commons' refers to the common wealth—the totality of the world's material riches to be shared together, mostly comprising such natural resources as the air, water, soil, or seed. The term has been used to critique the enclosure of agricultural land, pastures, and forests that were claimed as private property for private use over the course of several hundred years. The concept of hydrocommons as utilized by Neimanis pertains to planetary waters. It spans the oceans, rivers, and lakes that surround us, as well as the water that makes up much of our bodies. It acts as a framework for rethinking our ethical responsibility toward the many other bodies of water that flow through us, replenish us, and draw on us as their resource.

## hydrofeminism

Hydrofeminism is a feminist perspective that bears on ideas of embodiment and environmental justice. It examines the philosophical and ethical implications of where our water comes from, where it goes, and what happens along the way. Hydrofeminism considers the stakes of the intense interdependency of bodily and planetary waters, questioning what it means to be connected, indebted, and accountable to other planetary bodies of water. Furthermore, it considers how we might address acute planetary water crises (e.g., clean freshwater scarcity, floods and drought, groundwater contamination, ocean acidification) from the perspective of our wet constitution.

Building on their experience and knowledge, and drawing inspiration from Neimanis's conceptualizations, participants theorize related concepts of bodies of air, aerocommons, and aerofeminism. Participants produce mindmaps and discuss their ideas in smaller groups of two to four people, before sharing the discussion results with the different groups and noting them on a whiteboard or sheets of paper. The topics and questions participants may address are the following:

What sets of planetary assemblages emerge if we imagine ourselves as bodies of air?

What does air bring into contact?

What are the different ways in which we are all involved in airy interactions and circulations?

What are the power relations that circulate in these currents?

To what processes of intake, transformation, and exchange do the concepts of bodies of air and aerocommons point?

What are the different ways in which air can serve as an archive from which we can learn?

What have we done to the air, and what has it given back to our bodies?

What are our material and emotional relationships to polluted air?

In what ways do our relationships with the air and the more-than-human aerocommons challenge ideas of anthropocentrism and the privileging of the human as the main (or sole) site of embodiment?

What are the philosophical and ethical implications of our air's origin and destination, as well as the things that happen along the way?

What are the stakes of the intense interdependency of bodily and planetary air? What does it mean to be connected, indebted, and accountable to other planetary bodies of air?

By the end of the session, participants offer agreed-on preliminary definitions of the concepts of bodies of air, aerocommons, and aerofeminism. The aim is for the definitions to identify the common ground that they share with Neimanis's conceptualizations, as well as to emphasize what new possibilities they open for theorizing and actioning the figurations pertaining to the element of air.

follow-up protocol

## dust prints

In this follow-up protocol, participants create prints using the dust they gathered on their hands during the walkshop. Dust marks the temporality of matter through the material process of accumulation. Furthermore, the composition of urban dust varies significantly between different sites and even within the same site over time. Therefore, the dust prints made by participants capture a unique compilation of time, matter, movement, collectivity, and interaction.

**whom** is this protocol for?

This is a follow-up protocol for the participants of the walkshop. It should be carried out after the walk but before participants wash their hands.

**what** is required to carry it out?

The required materials are paper to make prints on and a spray bottle filled with water.

**how long** does it take?

The follow-up protocol takes ten to twenty minutes, including time for drying.

## instructions

To make dust prints, participants dampen the paper using the spray bottle. They then press their hands down on the paper, gently rolling them from side to side. Each print is left to dry on a flat surface.

**Image description:** Scanned image of dust handprints created by walkshop participants. Click on <https://www.researchcatalogue.net/view/1609630/2671403#tool-2674121> to see the image.

→ [intro](#)

→ [synthetic bodies: protocols for intra-acting](#)

→ [references](#)

This accessible page is a derivative of <https://www.researchcatalogue.net/view/1609630/2671404> which it is meant to support and not replace.

**Page description:** This protocol page invites readers to engage with chemicals absorbed from drinking water and excreted through bodily fluids. The content is arranged in a linear order from top to bottom.

## leaky bodies. protocol for bodies of water

Our bodies use water to absorb and excrete chemicals. Chemicals enter ground and surface water and circulate with it. These chemical agents include ingredients in everyday consumer products or components of road dust. They also include chemicals that are used to protect plants in agricultural lands and urban green areas or released in oil and gas extraction and processing byproducts, industrial waste, and animal byproducts. When we eat and drink, chemicals in water pass through the digestive system. They enter our bloodstream through pores, small cracks, and cuts in our skin. They also enter through our respiratory system as we inhale air containing water vapor. We predominantly excrete and secrete chemicals in liquid form—through urine, sweat, tears, and other bodily fluids.

Water nourishes and sustains us. But the chemicals that enter our body with water also have the potential to harm us. [Astrida Neimanis](#)'s concept of bodies of water can help us navigate our vulnerable watery embodiment in relation to wounds suffered by planetary waters and water systems. What does it mean to be a body of water when the water it contains is increasingly contaminated by anthropogenic pollutants? What collectivities, complicities, vulnerabilities, and responsibilities are we implicated in when we drink, wash our hands, clean objects around us, urinate, sweat, sneeze, or cry? This protocol invites participants to engage with the chemicals they absorb through drinking water and excrete through urine, sweat, saliva, and other body fluids and secretions.

**whom** is this protocol for?

This protocol is designed for a workshop with a small group of participants (four to twelve people). One participant will act as the facilitator, or participants can take turns in this role.

**what** is required to carry it out?

Participants should bring samples of the water they usually drink throughout the day or use to prepare tea or coffee. They can bring up to three different samples, such as tap water from home and a sample from a water dispenser at work or school. The facilitator ensures there are enough bottles or containers (ideally made of glass) for all the samples, as well as glasses or cups for drinking. Additionally, a whiteboard or large sheets of paper, markers, and tape are needed.

**how long** does it take?

The protocol takes three to five hours.

## **instructions**

The workshop facilitator welcomes participants and covers venue housekeeping details. The facilitator introduces the topic of absorbing and discharging chemicals through water, inspired by hydrofeminist [Astrida Neimanis](#)'s figuration of bodies of water.

According to Astrida Neimanis, water, more than any other element, entangles human bodies with more-than-human worlds. Given that up to three-quarters of the human body consists of water, its significance extends to numerous essential bodily functions, such as regulating temperature, supporting kidney function, maintaining blood density, and facilitating waste removal. Neimanis considers the profound interdependence between human and planetary waters, exploring their origins, paths, and transformations. Where does our water come from? Where does it go? What happens along the way? Building on Neimanis's ideas, the session delves into the implications of this interconnectedness, emphasizing our responsibility toward other planetary bodies of water that flow through us, replenish us, sustain us, and depend on us.

The workshop delves into these relationships, particularly focusing on the escalating contamination of water by human-made chemicals. Given water's universal solvent properties, it has the capacity to dissolve a myriad of substances upon contact, altering its composition and quality in the process.

The workshop primarily focuses on drinking water and the contaminants we ingest through it. Tap water undergoes various treatment stages before reaching consumers, typically involving coagulation, sedimentation, filtration, and disinfection processes. Despite these treatments, small amounts of contaminants, both natural and anthropogenic, persist in the water. The types and concentrations of these contaminants vary depending on the materials through which groundwater flows and the quality of the recharge water. Groundwater passing through sedimentary rocks and soils may accumulate compounds like magnesium, calcium, chloride, arsenate, fluoride, nitrate, and iron. Anthropogenic contaminants encompass synthetic byproducts from industrial and agricultural production, such as heavy metals (mercury, copper, chromium, lead), hazardous chemicals, dyes, insecticides, and fertilizers. Improper storage or disposal of household chemicals, including paints, detergents, solvents, oils, medications, disinfectants, bleach, pool chemicals, pesticides, batteries, gasoline, or diesel fuel, can also contribute to groundwater contamination. Microbial contaminants include pathogens like bacteria, viruses, protozoa, and worms. Moreover, water may acquire additional chemical and microbiological contaminants as it travels through pipelines, which could be contaminated or rusty. Even bottled water is vulnerable to groundwater contamination, and depending on its source well, it may be more polluted than municipal drinking water from public systems. Public water undergoes more stringent monitoring and testing for safety purposes.

The workshop commences with a round of introductions. Participants briefly introduce themselves unless they are already acquainted. Following this, they share details of their daily

drinking habits and provide information about the water sample they brought. The session facilitator records pertinent details about each sample on the whiteboard or sheets of paper. This includes identifying the water source, potential contaminants arising from its origin, and any treatments employed to enhance its quality (e.g., toxin and microbe removal, filtration, boiling, or cooling). Utilizing both collective group knowledge and online resources, participants collaborate to gather as much information about the samples as possible.

Once information about all the samples is collected, the facilitator announces that after a brief break, the session will proceed with sampling the waters. Before submitting their bottles to the facilitator, participants taste and smell their samples, endeavoring to recall their distinct characteristics to differentiate them from others.

During the break, the facilitator transfers all samples from their original containers into prepared bottles or containers, assigning each a number for identification.

Upon reconvening, participants taste the numbered samples and provide observations addressing the following inquiries:

From which source could the sample originate?

Is it sourced from tap water?

Does it exhibit any taste or odor of chlorine?

Does it appear to have undergone filtration or other purification methods?

Is it derived from bottled spring water or dispensed from a water cooler?

What specific smells and tastes are present in the sample?

After fifteen to thirty minutes of tasting, the session progresses with a round where participants articulate their observations and attempt to recognize their respective samples. In addition to discussing specific sample characteristics, participants are prompted to reflect on broader insights gained from the tasting experience. Following each participant's presentation of observations and shared insights, the session facilitator unveils the identities of the samples.

Following a short break, the session facilitator provides participants with an overview of the subsequent workshop segment, which explores potential water contamination from bottles utilized for storage and transportation.

When water is bottled, there's a risk that some of the packaging material may seep into the water, particularly under conditions of high temperature or prolonged storage. Water bottled in polyethylene terephthalate (PET), the most commonly used plastic for beverage packaging, may contain microplastics (small plastic debris less than 5 mm in size) and toxic chemicals at potentially hazardous levels. Although PET bottles don't contain bisphenol A (BPA), a compound notorious for its endocrine-disrupting properties found in other plastics, they do contain phthalates, which can also leach into the water and disrupt hormonal and physiological systems. Phthalates are chemicals utilized to enhance the flexibility and durability of plastics. They serve as plasticizers and solvents found in various products, including vinyl flooring, lubricating oils, soaps, shampoos, hairsprays, cosmetics, and personal care products. Despite being rapidly converted into breakdown products and excreted in urine, phthalates remain a significant health concern due to their widespread presence. Phthalates and their metabolites migrate into drinking water, rivers,

sewage sludge, sediment, and soil, impacting plant and animal life.

Most plastics, including PET, are derived from fossil fuels, a finite and non-renewable resource dating back millions of years. Once transformed into plastics, these materials persist in the environment for centuries, disrupting ecosystems. Moreover, the production, recycling, and transportation of plastic bottles contribute significantly to carbon dioxide emissions.

In this segment of the workshop, participants delve into the materials used in manufacturing their bottles. If they possess a plastic bottle, they can locate the resin identification code on the base to determine its composition. This code is devised to facilitate proper recycling by identifying the material. Apart from polyethylene terephthalate (PET or PETE), common plastic materials include high-density polyethylene (HDPE), low-density polyethylene (LDPE), and polystyrene (PS). During this phase, participants locate and exchange information about their bottles and the various materials they're made of, with the workshop facilitator recording this data on the whiteboard or paper sheets. Upon completing this task, participants engage in a discussion regarding the extensive network of relationships implicated by the simple act of drinking water from a bottle. Drawing from the insights gathered during the workshop, participants construct a map or diagram illustrating these temporally and spatially extended connections. They establish linkages, offer predictions, and contemplate narratives and histories. Embracing the hydrofeminist perspective advocated by Neimanis and utilizing their maps/diagrams, participants ponder the philosophical and ethical ramifications of consuming water from a bottle.

In the workshop's final phase, the facilitator emphasizes to participants that water serves as a crucial conduit through which potentially harmful chemicals enter and exit our bodies. It's noted that water acts both as a contaminant and a purifier of our bodies. Waste materials, such as urea, ammonia, lactic acid, potassium chloride, sodium chloride, phosphates, along with synthetic chemicals like pesticides from dietary intake and traces of pharmaceuticals, are expelled through urine and sweat. To signify these intricate watery relations, the workshop concludes with participants gathering any remaining water and embarking on a collective journey to the nearest river, lake, or other body of water. Together, they pour the collected mixture into the water they visit, symbolically marking the interconnectedness and interdependence of bodily and planetary waters, thereby bringing closure to the workshop.

**Image description:** A series of seven images from the workshops in Brno, held in October and November 2022, showing participants engaging in the water-sensing exercise and reflecting on their insights into body-water connections. Click on <https://www.researchcatalogue.net/view/1609630/2671404#tool-2674198> to see the images.

- [intro](#)
- [synthetic bodies: protocols for intra-acting](#)
- [references](#)

This accessible page is a derivative of <https://www.researchcatalogue.net/view/1609630/2671407> which it is meant to support and not replace.

**Page description:** This protocol page proposes a hydromeditation, encouraging readers to reflect on the exchange between the body and water. The content is arranged in a linear order from top to bottom.

## hydromeditation. protocol for bodies of water

Drawing on [Astrida Neimanis](#)'s concept of bodies of water, this protocol examines water as a mediator of chemical relations.

This protocol takes the form of a hydromeditation. Participants submerge themselves in water, bringing their attention to the exchange between their body and the water—what their body absorbs from the water and what the water absorbs from their body.

**whom** is this protocol for?

The protocol is for individual practice. However, participants may choose to team up with others for mutual support during the sessions.

**what** is needed to carry it out?

Participants need to find a body of water in which they can fully and safely submerge themselves.

**how long** does it take?

The session lasts for one hour.

### instructions

Find a safe body of water where you can fully submerge yourself. Bodies of water in urban areas popular with swimmers and bathers, such as public pools or seaside resorts, provide rich grounds for research on contaminants. Nevertheless, there are plenty of pollutants even in bodies of water perceived as clean. Contaminants in public pools include urine, sweat, saliva, skin tissue, sebum, hair, and pollution from swimwear and cosmetics. Disinfectants like chlorine react with these substances, forming chloramines, which cause the typical chlorine smell and can irritate skin, eyes, and respiratory systems. In addition to contaminants introduced by swimmers, outdoor pools and open water are susceptible to environmental contaminants such as windblown dirt, debris, polluted incoming water, and UV filters from sunscreens, which have endocrine-disrupting effects. In sum, both indoor and outdoor pools and open water contain mixtures of viruses, bacteria, protozoa, fungi, and synthetic chemical

substances that are potentially harmful to human and nonhuman health.

Hydromeditation is a form of meditation that encourages reflection on our existence within more-than-human worlds, which demand chemical exposure as the condition for living. It is an exercise with a double purpose—both a research situation and a simulation of life challenged by chronic exposure, recomposing our body and reorganizing our sensorial and perceptive systems. Being submerged in water presents our bodies with multiple challenges. These range from oxygen deprivation to a limited ability to move well through liquid and dulled and distorted sensory perception. Hydromeditation explores this heightened vulnerability under water with a focus on the changes that occur in the functioning of our bodies and sensory organs while water flows over them.

Hydromeditation aims to facilitate reflection on the complexities of living in a chemically complex world, fostering a deeper understanding of our interconnectedness with these environments. By simulating chronic exposure, it encourages contemplation of how our bodies and senses adapt and respond to ongoing chemical interactions. This reflective practice highlights our increased vulnerability underwater, emphasizing the body's response to its environment and the sensory shifts that occur, inviting us to contemplate the broader implications of living in a world where chemical exposure is unavoidable.

The hydromeditation is carried out in ten dives, interspersed with brief breathing intervals. Between the dives, take a couple of deep breaths to relax. Then exhale completely and take a quick, deep breath, filling your lungs with fresh air before submerging your body in the water. Stay calm and relaxed, allowing the water to move you rather than actively moving your body. Focus on the sensory and functional changes in your body as you interact with the water and its chemical contents.

### **first dive**

During the first dive, focus on how your body and the water come into contact and interact. Bring your attention to how the two bodies of water enter each other.

### **second dive**

During the second dive, explore the sensory information provided by touch, including the effects of changes in ambient pressure, temperature, gravity, and movement through the water. The sense of touch is reduced under water. Skin is less sensitive to stimuli; we even feel less pain. Nevertheless, attempt to detect any irritations caused by chemicals, despite reduced tactile sensitivity underwater. What can you feel? Is the contact with water pleasurable or irritating? Do you experience any itchiness or burning sensations?

### **third dive**

During the third dive, focus on the sensory information provided by your eyes. If safe and comfortable, open your eyes underwater. Reflectivity and light transmission are different in the underwater environment, which is dimly lit compared with the light above the water. This results in lower contrast, distorted proportions, and a modified color spectrum. Observe the fuzzy and distorted view, noting differences in reflectivity and light transmission compared with

air. Chemically treated water or seawater stings the eyes and adds to the fuzziness and blurriness of our underwater vision. Consider the effects of chemically treated or seawater on your vision. Do these various factors cause eye irritation? What is the character of this irritation? If you do not open your eyes underwater, focus on the tactile sensations and any irritations felt with closed eyes. Spend some time exploring these sensations even once you finish the dive and open your eyes. Does the water make your eyes painful, irritated, or sensitive to light? Do you experience cloudy or blurry vision?

#### **fourth dive**

The fourth dive concentrates on the sense of smell. Before submerging your body, take a breath close to the water's surface, focusing on what you can smell. Use your time underwater to reflect on the smells you detected. In pools with chlorine-treated water, contemplate the characteristic odor caused by chloramines, which are more-than-human compounds—also known as combined chlorine—formed when free chlorine reacts with organic substances such as sweat, saliva, or urine. In swimming pools and open water bodies popular with swimmers and bathers, rich mixtures of cosmetic ingredients worn into the water by swimmers may be detected in the air. These include fragrances from perfumes and cosmetics or traces of sunscreens. At seaside resorts, you may detect fumes from boats. Try to capture as many subtle nuances of what you can smell as possible. What are the smells like? What do they remind you of? What are their likely sources? Do they seem to be of organic or synthetic origin? How do they make you feel? Does the air cause your throat to become dry, rough, scratchy, or itchy?

#### **fifth dive**

The fifth dive focuses on the sensory information provided by the sense of taste. Despite efforts to prevent accidental gulps, water inevitably reaches your sensitive taste buds. Use your taste receptors to analyze the chemical content of the water. What sensations do the traces of water in your mouth provoke? How do these sensations make you feel? What substances and compounds—whether of physiological or synthetic origin—may be responsible for these sensations?

#### **sixth dive**

During the sixth dive, use all your senses to reflect on what your body absorbs from the water. Bring your attention to the water and all that it contains as it fills the pores of your skin, nostrils, mouth, ear canals, and other body orifices. What does the water bring into your body? How does it feel? Do you perceive the tight embrace of the water around you as soothing and relaxing? Do you experience it as irritating? Does the water entering your body make you feel anxious or worried?

#### **seventh dive**

During the seventh dive, meditate on your becoming with water and everything it contains. Focus your imagination on the chemical molecules you absorb—contemplate how these molecules enter your skin, respiratory system, gastrointestinal tract, and cardiovascular system. Visualize them circulating in your body, attaching to receptors, and becoming part of the fabric of your being. Who are you becoming with this water? Deepen your awareness of

the intimate connection between your body and the water, as well as the profound impact of chemical interactions on your identity and well-being.

### **eighth dive**

During the eighth dive, turn your attention to what you discharge into the water. Reflect on the tiny bits of your body that you introduce to the water and that the water absorbs from you. These bits include skin tissue, hairs, sweat, nose and throat saliva, sebum, pollution from your swimwear, and cosmetics you use. Consider the material trace your body leaves in the water. How extensive is this material trace? Deepen your understanding of the impact of your presence in the water and the contributions you make to its composition.

### **ninth dive**

During the ninth dive, meditate on the aftermath of the traces of your material presence in the water. Contemplate the possible impacts of your presence in the water on its life, even after you emerge from it. Focus particularly on your chemical footprint. Consider the chemical ingredients from the cosmetics you use, the medications and synthetic chemicals in your diet, and every chemical you absorb, metabolize, and discharge. Synthetic chemicals take longer to dissipate and break down in the environment compared to physiological matter, causing them to build up over time. Reflect on how the chemicals you discharge circulate in the water, react with other chemicals, bioaccumulate, and biomagnify, ultimately affecting the lives of both human and nonhuman organisms that they reach. What is this water becoming with you?

### **tenth dive**

During the last dive, relax your body and mind, focusing on the experience of sympleiotic becoming with water. Sense and imagine the fluidity, coolness, and refreshing moistness of your body as it connects to the body of water in which you are submerged. Meditate on what connects you to this water and what you share with it. How does this connection make you feel? What do you perceive as you merge with the water? What insights or revelations arise from this experience? Deepen your understanding of your interconnectedness with the water environment and foster a sense of unity and harmony with it.

After the final dive, you may continue your hydromeditation while swimming and relaxing in the water. Upon exiting the water, allow the remaining water to dry and absorb rather than wiping it off with a towel. During this process, observe what the water and its contaminants bring into your body and what they take away. Does the water draw moisture out of your skin and eyes, leading to dehydration? How does your skin look and feel? Do you experience any redness, stinging sensations, or allergic reactions? Does the water irritate your eyes, interfering with their natural tear membrane and causing redness or puffiness? Do you feel any dryness or stickiness in your mouth or throat? What is your breathing like?

Reflect on both unpleasant and pleasurable thoughts and sensations experienced during your time in the water and after you emerged from it.

*note on consent*

This protocol was inspired by my love of swimming. I swim regularly at a local pool situated midway between my home and workplace. As both an avid swimmer and an atopic eczema sufferer, I was prompted to reflect on how environments that provide pleasure and nurture can also cause harm. The protocol is suitable only for those who, like me, feel comfortable in and around large bodies of water. Those who do not wish to follow this specific protocol can draw inspiration from it and create alternative protocols reflecting on how, in the Anthropocene, we are simultaneously nourished and threatened by the environments on which we depend for our survival.

**Image description:** GIF of the swimming pool at Kraví hora in Brno. Click on <https://www.researchcatalogue.net/view/1609630/2671407#tool-2825075> to see the image.

- [intro](#)
- [synthetic bodies: protocols for intra-acting](#)
- [references](#)

This accessible page is a derivative of <https://www.researchcatalogue.net/view/1609630/2671409> which it is meant to support and not replace.

**Page description:** This protocol page introduces the Endocrine Disruption Tracker Tool (EDTT), which uses disrupted emotions as an index of chemical disruption, inviting readers to reflect on the emotional impact of endocrine-disrupting chemicals. The content is arranged in a linear order from top to bottom.

## **getting angry with endocrine disrupting chemicals. protocol for affirming emotions caused and modulated by chemical exposure**

This protocol is based on the Endocrine Disruption Tracker Tool (EDTT), a speculative instrument that uses disrupted emotions as an index of chemical disruption. Focusing on a group of chemicals known as endocrine-disrupting chemicals, the protocol invites participants to experience and reflect on the far-reaching effects these chemicals have on their emotions. The aim is to affirm emotions disrupted by chemicals and to harness and mobilize these emotions for action.

**whom** is this protocol for?

The protocol is designed for small to medium groups of participants (four to twelve people). One participant will assume the role of facilitator, or participants can take turns acting as the facilitator.

**what** materials are needed to carry out the protocol?

The materials required for the protocol are a pen and printed [copy of the EDTT](#) for each participant, a whiteboard or large sheets of paper, markers, and tape.

**how long** does it take?

The protocol consists of two sessions, each lasting three to four hours, spaced approximately ten days apart. Between the two sessions, participants will individually make observations and note them on the EDTT sheet, which will take about ten to fifteen minutes per day.

### **instructions**

#### **Step 1: Introductory meeting in which participants discuss chemical exposures**

In step 1, the session facilitator welcomes the participants, provides housekeeping details for the venue, and introduces the topic—chronic exposure to environmental chemicals, its public (in)visibility, and the effects of these chemicals on our emotions. If participants are not well-

acquainted, a brief round of introductions takes place. During the introductions, participants may mention why they are interested in either topic (exposure to chemicals or emotional health). Following this, participants are given copies of the EDTT and are briefed about endocrine-disrupting chemicals.

Endocrine-disrupting chemicals (EDCs) are industrially manufactured substances capable of interfering with the way the body's hormones work. Similar to physiologically produced hormones, chemical endocrine disruptors act as chemical messengers, circulating through the bloodstream and influencing the functions of organs and tissues.

Developmental and lifetime exposure to endocrine-disrupting chemicals via environmental pathways increases susceptibility to a wide range of pathologies in humans and animals. Exposure to them has been linked to hormone-sensitive cancers, lower sperm counts, infertility, endometriosis, early puberty, autoimmune diseases, diabetes, obesity, osteoporosis, cardiovascular issues, growth disorders, and neurological and learning disabilities. This protocol focuses on the effects on neurodevelopment and brain function, and thus also on our thoughts, feelings, and motivations.

Common endocrine disruptors include BPA found in plastic bottles, food containers, and liners of metal food cans; phthalates and parabens in cosmetics; detergents in household cleaners; and flame retardants in furniture and electronics. Beyond their presence in everyday consumer products, endocrine-disrupting chemicals are prevalent in industrial processes, including polychlorinated biphenyls used as industrial lubricants and coolants, chemicals released during oil and gas extraction, and pesticides used to protect crops from weeds, insects, rodents, and fungi. Additionally, industrial wastewaters and livestock waste are major sources of endocrine disruptors.

The session proceeds with discussions in smaller groups of two to four people. Participants engage in discussions revolving around the following questions:

How much do you believe environmental chemicals may affect your life? In what ways?

The amounts of anthropogenic chemicals in the environment are increasing. Do you agree?

What anxieties and fears associated with chemical risks do you experience

What measures do you take to mitigate exposure to chemicals?

What are the established, presumed, or perceived consequences of chemical exposure that you encounter?

What are the established, presumed, or perceived consequences of chemical exposure experienced by individuals you are acquainted with?

What prompts you to be attentive to the presence of chemicals in the environment and the risks that they may pose?

Following forty to sixty minutes of small-group discussion, the findings are exchanged among participants from various groups and recorded on a whiteboard or paper sheets.

Concluding the introductory segment of the protocol, the facilitator furnishes participants with details about the EDTT and instructions on its utilization.

The Endocrine Disruption Tracker Tool (EDTT) functions as a means to detect the

presence of endocrine-disrupting chemicals by focusing on their impact on our emotions. While the effects of physiological hormones on cognitive, emotional, and sensory changes have long been recognized, the examination of emotional symptoms related to endocrine disruption remains unexplored. The EDTT considers symptoms such as anxiety, irritability, mood swings, difficulty concentrating, and fatigue, commonly associated with hormonal fluctuations, in the context of endocrine disruption.

The EDTT is adapted from a Premenstrual Symptom Tracker (IAPD 2021), which tracks emotional symptoms caused by the fluctuation of hormones during the menstrual cycle. It is modeled on the 2021 variant of a Premenstrual Symptom Tracker developed by the International Association for Premenstrual Disorders.

The EDTT retains the same set of ten emotional symptoms while excluding the only physical symptom on the list. Significantly, the EDTT broadens its scope to encompass emotional symptoms caused by the production and interplay of both hormones and hormone-mimicking chemicals.

Participants engage in a ten-day review, during which they assess the emotional symptoms listed. Each day, they reflect on their experiences and observations of these emotions, recording them in the chart. They consider emotions both as they are personally experienced and as they are shared with or observed in others. Participants describe the emotion and the context in which it occurred, reflecting on its impact on their daily life and well-being. Additionally, they consider the potential influence of chemical exposure on the intensity and onset of these emotions.

**Image:** A series of four images documenting the Endocrine Disruption Tracker Tool, a foldable brochure featuring a chart for tracking emotional symptoms influenced by the interplay of hormones and endocrine-disrupting chemicals. Click on <https://www.researchcatalogue.net/view/1609630/2671409#tool-3098297> to see the images.

## **Step 2: Review of disrupted emotions using the EDTT**

Throughout the ten-day duration constituting step 2, participants engage in the EDTT review. During this phase, they are tasked with scrutinizing the list of emotional symptoms, making individual observations, and recording emotions in the EDTT chart.

## **Step 3: Follow-up session in which participants discuss the possible influence of chemical exposure on their emotional health**

The follow-up session of step 3 commences with participants sharing insights gained from their emotional review, both from personal experiences and observations of others. Collaborating with the session facilitator, participants record these observations on the same whiteboard or sheet of paper utilized in the previous session to explore chemical exposures.

The session proceeds with participant-driven discussions in smaller groups of two to four individuals, where they further explore the topics of exposures and emotions. Participants engage in conversations guided by the following questions:

To what extent do your 'negative' emotions impact your daily life and well-being, as well as the daily lives and well-being of others? In what ways?

How do 'negative' emotions of those around you affect your life and well-being?

Do you agree that feelings of anger, irritation, frustration, and sadness are common occurrences among people today?

How do you experience and express your 'negative' emotions?

How do others react to your expressions of 'negative' emotions?

What steps do you take to prevent the emergence of 'negative' emotions?

Who do you talk to about your feelings of anger, irritation, frustration, and sadness?

What kind of response do you receive when you share these emotions?

Who shows concern for your feelings of anger, irritation, frustration, and sadness?

Do you respond with care when others express their anger, irritation, frustration, and sadness?

Do you understand the causes of your anger, irritation, frustration, and sadness, or do these emotions sometimes appear unexpectedly, out of nowhere?

Do you think environmental chemicals could influence or modulate your emotions?

After forty to sixty minutes of small-group discussion, the results are shared among all participants and noted on a whiteboard or sheets of paper.

The main topic of the follow-up session is the possibility of tracking and affirming emotions as they are affected by chemical exposure. The session facilitator briefs participants on this topic:

Exposure to endocrine-disrupting chemicals impacts our emotions. However, distinguishing the influence of chemical endocrine disruptors from naturally produced hormones and other hormonally active agents, such as pharmaceutical hormones, is challenging. Endocrine-disrupting chemicals penetrate our bodies and interfere with our endocrine systems to an unknown extent. Consequently, it's difficult to assess how much these disruptors influence our emotions. Given their ubiquity, it is likely that they impact our emotions, but just how extensive this influence is and whether it is implicitly harmful, giving rise to emotions that we consider 'negative,' unpleasant or unhappy, cannot be conclusively established. Within the context of the complex interplay of intra-acting components, nonlinear dynamics, and the spontaneous emergence of new phenomena, we must approach the impact of endocrine disruptors with caution. The mutual co-constitution of material and social phenomena, shaped by the possibilities of a given situation, means that their effects cannot be predicted in advance but unfold within concrete, situated processes of performative becoming. What makes chemical endocrine disruptors toxic may not ultimately be solely their biochemical properties, but also their origins in unethical, profit-driven industrial practices and the involuntary nature of our exposure to them.

The EDTT is not designed to provide conclusive answers about endocrine disruption. Instead, it aims to raise awareness of our entanglement with global infrastructures of human-made chemicals. By locating the effects of endocrine disruption in our anxiety,

sadness, sleeplessness, irritability, and inability to concentrate, the EDTT foregrounds our shared—albeit unevenly—fragility and vulnerability vis-à-vis the chemical transformation of the planet. Reflecting upon the mobility and interactivity of chemical endocrine disruptors, and the porosity of the body as it absorbs and excretes chemicals, unsettles the atomistic conception of humans as bounded individuals, who are divorced from the broader collectivity of nonhuman life in a shared environment.

By focusing on the diverse—and not necessarily always harmful—effects of exposure to endocrine disruptors in our lives, we can achieve a richer and more politically generative understanding of our collective becoming with global networks of industrial chemicals. Contemplating and experiencing the far-reaching effects of endocrine-disrupting chemicals on our emotions can help us address the challenges of our chemically altered lives and foster responsive care relations. Thinking with, and acting upon, the anger, irritability, anxiety, or depression caused and modulated by involuntary chemical exposure paves the way for an embodied, experientially, and materially grounded politics of anti-toxic action.

The session continues with small-group discussions of two to four people. In these groups, participants explore the likely influence of endocrine-disrupting chemicals on their emotions and the potential role these emotions play in addressing the hidden, slow-moving, and emerging realities of a chemicalized life. Questions participants may discuss in their groups include:

How can our emotions influenced by chemical endocrine disruptors help us understand the hidden, slow-moving, and emerging realities of chemicalized life?

How can these emotions help us confront the uncertainties and ambiguities of our chemicalized existence?

How can we experience and express these emotions to foster and exercise solidarities with a view to opposing involuntary chronic exposure to environmentally ubiquitous endocrine disrupting chemicals?

What might the affective politics of anti-toxic action look like?

After twenty to forty minutes of small-group discussion, the results are shared among the groups and noted on the whiteboard or sheets of paper. A new list, map, or diagram is created to outline affective strategies of resistance. Comments, questions, and suggestions are added to this new section to elaborate on the pre-existing threads. In addition to developing and adding new concerns, participants identify and mark emerging connections and intersections within the working arrangement. At the end of the session, the facilitator photographs the research results. These photos are used to start a shared working document that all participants can access and continue to expand.

**Video description:** An audio recording in Czech, accompanied by an English transcript, titled *Expositions & Emotions*, recorded during the workshops in Brno in Autumn 2022. Click on <https://www.researchcatalogue.net/view/1609630/2671409#tool-2674225> to listen to the recording and read the transcript.

**Images description:** A series of five images. The first two images document the EDTT project featured in the *Synthetic Becoming* exhibition at FaVU Gallery in Brno, which took place from December 6, 2022, to February 10, 2023. The EDTT installation includes a wooden table displaying the EDTT tool, explanatory text about the research project, and an audio recording of the workshop for visitors to listen to. The remaining three images are scans of the EDTT chart for tracking emotional symptoms, annotated with participants' notes. Click on <https://www.researchcatalogue.net/view/1609630/2671409#tool-2674226> to see the images.

Learn more about the workshops in my article [Getting Angry with Endocrine Disrupting Chemicals](#).

**Video description:** *The Sadness of the Anthropocene*, 2023. A short film exploring the impact of chemical endocrine disruptors on emotions, examining the complex relationship between our emotional states and the environments we live in, which in turn, shape us. Click on <https://www.researchcatalogue.net/view/1609630/2671409#tool-2675692> to watch the video.

[The Sadness of the Anthropocene](#), 2023, short film introduction to the topic of chemical endocrine disruptors affecting emotions

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This accessible page is a derivative of <https://www.researchcatalogue.net/view/1609630/1697136> which it is meant to support and not replace.

**Page description:** This page lists references in a linear order from top to bottom.

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