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ORIGINAL ARTICLE

Choreographies of nearness: self and other in personal cancer immune therapy research

Mie S. Dam[1] · **Tone Druglitrø**[2]

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Abstract

This article explores the practical and material configurations of the 'person(al)' in experimental cancer immune therapy, where immune cells from the patient's cancer tissue are used to eliminate incurable cancers. Drawing on ethnography from Denmark, we examine personal cancer immune therapy as a carefully steered practice—a choreography—through which tissues and cells originating from the same person are reconfigured in unpredictable ways. Cancer tissue, conventionally perceived as a dangerous 'other', holds the potential to act as a lifesaving 'self' in the form of a personal cure. Conversely, T-cells, conventionally perceived as protectors of the embodied 'self', can act as life-threatening 'others', endangering the person from whom they originated. We develop the notion of 'choreographies of nearness' to analyse how immunological and ontological relations are enacted in the clinical and experimental practices of personal cancer immune therapies. Tracing the execution of clinical protocols in ethnographic detail, we show that this emerging medical practice involves choreographies through which tissues and cells are enacted as neither strictly self nor other, but as '*near*' the embodied person from whom they derive. Unpacking the potential of the 'near self', we expose the laborious and high-stakes ways of doing the 'person(al)' in this therapy.

Keywords Immune therapy · Personalised medicine · Cancer · Person · Ethnography · T-cell therapy

✉ Mie S. Dam
mda@sund.ku.dk

[1] Centre for Medical Science and Technology Studies, Department of Public Health, University of Copenhagen, Øster Farimagsgade 5, 1014 Copenhagen, Denmark

[2] Centre for Technology, Innovation and Culture, University of Oslo, Oslo, Norway

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Introduction

Adoptive T-cell therapy encompasses a group of personalised anticancer treatments in which the patient's own cancer-fighting immune cells—the T-cells—are harvested and harnessed to eradicate cancer. Hailed as the next breakthrough in oncology, these cellular therapies are currently being developed within clinical trial protocols and in clinical practice (Adhikary et al. 2024; Kiyotani et al. 2021).

Denmark hosts one of the very few translational research centres in Europe which develops and clinically tests adoptive T-cell therapies. The country has a longstanding tradition of investing in life science innovation, and in 2016, a national strategy was introduced to integrate personalised medicine into the tax financed universal Danish healthcare system (Ministry of Health 2016). With an articulated focus on genetics and with cancer as a prominent example, the strategy highlighted that treatments tailored to the genetic disease characteristics of individual patients are both more effective and less invasive than the traditional one-size-fits-all approach to healthcare. Over the last decade, the field of personalised oncology has also become bound to advances in personalised cancer immune therapies based on the patient's own biological material (Chiapperino et al. 2024), a shift which is reflected in the focus on cell-based therapies in the new Danish Strategy for Personalised Medicine (Ministry of Health 2025). In this article, we take Denmark as a compelling site for exploring how the 'person(al)' is experienced, practised, and renegotiated in these new and advanced biomedical practices.

We focus on protocolised adoptive T-cell therapy that utilises the T-cells already present within the patient's tumour tissue, known as tumour-infiltrating lymphocyte (TIL) therapy. In a nutshell, a treatment protocol is a detailed plan that, besides describing eligible patients, includes schedules outlining the tests and medications to be administered, as well as a list of known side effects and guidelines for managing these. The TIL protocol is built around trial and treatment processes that include advanced laboratory procedures for expanding tumour-specific T-cells over several weeks before they are activated and reinfused into the patient's bloodstream to recognise and eliminate remaining cancer cells throughout the patient's body (Rohaan et al. 2022). TIL therapy is thus a highly individualised form of personalised medicine, in which donor and recipient are the same person. Concurrently, it is a distributed practice that extends across multiple sites and beyond the individual, as knowledge from each trial contributes to refining the protocol for future treatments.

Based on ethnographic fieldwork from TIL therapy research in Denmark, the ensuing analysis interrogates the ontological status of the 'person(al)' in this emergent biomedical practice. In TIL therapy, we demonstrate, the enactment of a patient's tissues and cells oscillate between self and other, not as a stable opposition but through carefully steered material semiotic practices (Cussins 1996) exposing the laborious and high-stakes character of remaking and upholding the 'person(al)' in personalised cancer immune therapy. The questions we ask are: How is incurable cancer transformed into a potential personal cure? And how, through this transformation, are the boundaries around disease and cure, harm and care, and self and other, unsettled and redrawn?

By posing these questions, we tease out how patients and professionals involved in personal TIL therapy navigate and experience the intimate relationship between cancer tissue, immune cells, and the embodied person from whom these bodily materials originate. We show how this complex practical, ethical, and ontological coordination involves what we call 'choreographies of nearness'—carefully steered practices that aim to balance selfness and otherness in the hope of creating a personal cancer cure. 'Choreographies of nearness' is crafted by bringing together two analytical concepts developed in science and technology studies (STS) and medical anthropology, "ontological choreography" (Cussins 1996, later Thompson 2005) and "nearness" (Svendsen 2022).

Through the notion of choreographies of nearness, we develop new analytical perspectives to study how immunological and ontological relations are worked upon and negotiated in personal cancer immune therapy on trial. Much like being "near" (Svendsen 2022), being personal connotes intimacy and closeness. Yet, just as Svendsen shows how the interspecies nearness she studied in the translational animal laboratory never collapses into sameness, the personal in personalised oncology holds open a space for difference: it constitutes a relation or a practice pertaining to persons, not the persons themselves. Navigating this space of difference, we argue, professionals and cancer patients enact not only the potential but also the risks and moral dilemmas of cancer immune therapies that are based on patients' own biological material.

In the analysis, we demonstrate how TIL therapy involves choreographies of a patient's tissues and cells that oscillates between self and other, and between the care and the harm entailed in experimental cancer immune therapy. While medical trial protocols exist that delineate carefully steered material semiotic practices (Cussins 1996), following the execution of TIL therapy protocols in empirical detail exposes the laborious and high-stakes character of remaking and upholding the 'person(al)' in personalised cancer immune therapy.

Beyond the self/other antagonism towards choreographies of nearness

Nowhere is the promise of personalisation stronger than in the field of oncology, where genomic analysis of tumour tissue has established that each cancer is unique and should ideally be treated accordingly (Kenny et al. 2021; Schwartzberg et al. 2018). Since the 1990s, the landscape of oncology has been profoundly shaped by genetics and genomics, with a strong focus on developing drugs that target specific mutations in tumour DNA (Plutynski 2018). However, as Löwy (2022) has recently argued, cancer immune therapy predates the epistemic dominance of genomics in oncology. Over the past decade, the field has experienced new "waves of enthusiasm" (Löwy 1994), giving rise to a new hybrid regime of "immunogenomic precision" (Chiapperino et al. 2025). While this emerging socio-technical regime brings complex epistemic and organisational implications (Chiapperino et al. 2021; 2025), personal immune therapies such as TIL therapy enact a form of bodily self-defence (Swallow 2024) that is immediately compelling and straightforward to communicate

to patients: it is a treatment highly personalised to recognise and attack cancer cells by enhancing the body's own immune defence against cancer (Davis 2018).

In this way, the working of TIL therapy aligns with a well-established public and scientific imagination of the immune system as guarding a rigid border between body (self) and disease (non-self) (Cohen 2009; Jamieson 2015; Martin 1990, 1994). In this imagination, T-cells are depicted as soldiers of the immune system and as integral to the embodied self, while cancer is portrayed as a hostile intruder—a 'non-self' that must be defeated (Jain 2013; Reisfield and Wilson 2004; Sontag 1978). Contesting these imaginations, social studies of immunology and oncology have emphasised the importance of paying attention to how these disciplines are continuously being shaped by and contingent upon complex social framings of body and disease that disrupt the self/other antagonism (Ford and Swallow 2024; Swallow 2024; see also Haraway 1991; Löwy 1991) and have demonstrated that understandings of immune responses are deeply entangled with the tools, materialities, and normative frameworks of cancer immunology (see also Cambrosio and Keating 1992). These perspectives resonate with the empirical setting of this paper and provide support for the need to study how the self and non-self are enacted in situated immunological and oncological practices, particularly when novel and experimental medical techniques are being introduced to personalise cancer care.

In conducting fieldwork in the Danish National Center for Cancer Immune Therapy (CCIT-DK), we met incurably sick patients who were hoping for the cancer inside their body to grow accessible metastasis that could be harvested and harnessed as a personal cure (see also Llewellyn 2022). We also followed health professionals who experienced that the reinfusion of the patient's own T-cells threatened the life of the most fragile patients, and that the health professionals had to struggle to make them survive therapy. These practices and experiences contrast with the dominant understanding of cancer as an unambiguously malignant intruder and the T-cells as part of the personal self and thus inherently safe. The material practice of using T-cells derived from patients' cancer tissue as the basis for a personal treatment, as is done in TIL therapy, thus blurs the discursively well-established self/other antagonism.

"Ontological choreography" (Thompson 2005) is a mode of approaching experimental, medical treatments as also reconfiguring identities and politics of the 'self'. As an analytical tool, it directs attention to the political and temporal contexts and stakes that are inscribed in (experimental) medical treatments. In the fertility clinics Thompson studied, infertile patients made high personal investments to undergo procedures where "self and body are objectified in many different ways" (Cussins 1996, p. 576) to fulfil their life-project of becoming parents (Thompson 2005). Analysing personal T-cell therapy as a series of ontological choreographies (see also Druglitrø et al. 2025), we glimpse not only the "the possibility of objectification co-existing with agency and subjectivity" (Cussins 1996, p. 576) but also the possibility—and the strangeness—of otherness co-existing with 'selfness'.

Like Cussins, we are analysing a clinical setting in which biotechnology is a central tool, yet our ethnographic setting is also inherently experimental. The patients we have followed are part of clinical trials, and thus the protocols for their treatments are continuously developing. TIL therapy can be described as an ontological

innovation concerned with transforming disease into cure within the very same person. In this new medical practice, cancer tissue and immune cells become loaded with practical, moral, and ontological ambiguities, uncovering that cancer immune therapy based on the patients' own bodily material involves whole new ways of thinking about self and other and the 'person(al)' in personalised medicine.

To capture how choreographies of TIL therapy are intensely technical, personal, and political, to paraphrase Cussins, we follow the cancer, the T-cells, and the patients into the laboratory and the clinic as 'choreographies of nearness'. "*Nearness*" as an analytical concept is developed in Mette. N. Svendsen's ethnographic studies of translational neonatology in Denmark, where laboratory piglets are made to model premature human infants by researchers replicating the practices of neonatal intensive care units. Through biological, material, and moral practices of approximation, the piglets Svendsen studied became near, yet never fully human. This interspecies nearness generated clinically relevant data but also exposed the ambiguities and the moral dilemmas of care and killing that are integral to laboratory animal research.

Svendsen unfolds that besides the immediate connotations of being alike, intimate and close, to be near someone or something also necessarily entails *not* being similar or alike the other. In our analysis, the ambiguity and the productivity of the distance and differences entailed in nearness come to the fore as tumours are distanced from the body, immune cells are isolated from tumours and then reinfused into the patient as a personal cure. In these practices, tissues and cells are enacted as neither fully self nor fully other, but as *near* the embodied person these bodily materials originate from.

Where Svendsen's cases begin with interspecies difference and move towards proximity—physically and morally—our analysis begins with sameness: cancer and immune cells entangled within the same body, becoming '*near self*' through practices of distancing. Together, Cussins' concept of *choreography* and Svendsen's concept of nearness thus provide an analytical framework that enables us to unpack the complex back-and-forth transitions (in and out of the patient's body) through which incurable cancer holds the potential of cure as well as the risk of collapse for the individual patient along with the production of scientific knowledge. *Choreographies of nearness* as it is developed in this analysis is thus an effort to analyse the intensely personal and political in TIL therapy through a focus on the extraction, expansion, and reinfusion of bodily material that constitutes TIL therapy protocols and that is performed across the cell lab and the cancer clinic.

In the analysis, we tease out three choreographies of nearness that are central to TIL therapy protocols and that are spatially, temporally, and ontologically distinct yet co-dependent: Choreographing cancer, choreographing T-cells and choreographing the patient. We argue that the separation and differentiation that is involved in being 'near self' holds powers which are not only benevolent but also unpredictable and dangerous. By unpacking the potentials and risks of the near self in personal TIL therapy, this article sheds new light on how distance and otherness co-constitute the person(al) in personalised oncology. Before we move into the analysis, we describe the site and context of the ethnographic fieldwork and the methodological approach that supports our analytical strategies.

Studying personal cancer immune therapy in Denmark

In Denmark, developments in the field of cancer immune therapy mainly take place at the Danish National Center for Cancer Immune Therapy (CCIT-DK). Since its establishment at Copenhagen University Hospital, Herlev, in 2006, clinical and basic researchers in this translational research centre have worked hard to enhance existing immune therapies and develop new methods to offer effective treatment to a broader range of cancer patients. While this highly specialised treatment form was first developed and clinically tested in the United States, the complicated laboratory methods of manufacturing the T-cell product have been established and significantly improved in the sterile cell laboratory at CCIT-DK. The reliance on advanced point-of-care laboratory facilities, intricate coordination across clinic, laboratory, and patient lives, combined with high upfront costs makes clinical integration of TIL therapy challenging (VIVE 2021). In collaboration, clinical and basic researchers at the centre continue to develop and refine the clinical treatment protocols with the dual goal of improving their therapeutic effect and aligning them with clinical practice.

While the treatment protocols vary from study to study, they all follow the same basic script. Eight days prior to T-cell reinfusion, patients are admitted to the oncology ward where they receive lymphodepleting chemotherapies for the following seven days. These chemotherapies reduce the number of 'regulatory' T-cells which are known to inhibit the activity of cancer 'killing' T-cells. The activated and expanded T-cells are then reinfused on day 0. For patients with metastatic melanoma, an aggressive and previously incurable stage of mole cancer, this treatment regime has shown promising results in several smaller clinical trials since the first clinical study was conducted more than a decade ago. Then, in December 2022, the first multicentre randomised controlled trial comparing personal TIL therapy to standard immune therapy was published. Conducted at CCIT-DK and in a Dutch research centre the study results were remarkable: up to 20% of the patients who received T-cell therapy experienced a complete and potentially permanent elimination of cancer cells, while around 50% of these otherwise treatment-resistant patients benefitted from the treatment (Rohaan et al. 2022).

Awaiting the years-long approval process by the European Medicines Agency (EMA), the Danish health authorities have allowed CCIT-DK to start an Early Access Programme (EAP) for TIL therapy (Copenhagen University Hospital, Herlev 2024). This means that regional Danish oncology departments can refer melanoma patients to CCIT-DK, which can then, upon an individual approval from the national Danish health authorities, offer TIL therapy outside the scientific and ethical framework of clinical trials and paid for by the referring region. TIL therapy is thus about to cross the border between trial and standard treatment, offering a second chance to cancer patients suffering from advanced and treatment-resistant melanoma—and, as our empirical material suggests—shifting the way we understand the relationship between body (parts) and disease, self and other, care and harm, and the 'person(al)' in personalised oncology.

Between December 2017 and November 2019, the first author, Mie S. Dam, conducted an ethnographic study following the introduction of genetically targeted anticancer medicine and personalised immune therapies in the Danish healthcare system. In this article, we primarily draw on empirical material generated at CCIT-DK, where Mie followed patients and professionals involved with TIL therapy. This part of the ethnographic study was conducted during two intense periods of fieldwork in 2019 and followed up by fieldwork visits in January 2020, a follow-up meeting with a leading oncologist in October 2023, and a research nurse in January 2024. During the fieldwork period, Mie followed clinical researchers at CCIT-DK as they enrolled and treated four patients under two experimental TIL protocols paid for by public and private research grants. While the procedure is largely the same as for melanoma patients, the likelihood of treatment efficacy in these early-stage trials is unknown and generally expected to be low. Due to the intensity of TIL treatment and the patients' health conditions, Mie was only able to closely follow two of the patients throughout their one-month hospital admission. These two patients engaged in numerous informal conversations with Mie, which were followed by in-depth interviews. The other two patients were likewise invited for an interview; yet only one of these interviews took place, as the other patient never recovered sufficiently to participate.

Besides fieldwork in the outpatient and inpatient clinic, Mie followed laboratory researchers to learn how cancer tissue and T-cells were worked upon and experimented with in the laboratory. In addition, a master student supervised by Mie carried out eight interviews with clinical and basic researchers in CCIT-DK, and together with her, Mie interviewed the three professors heading the centre. The ethnographic study has been approved by the Danish Data Protection Authorities. Danish law does not require formal ethics approval of such studies.

Choreographing cancer: when cancer becomes a potential personal cure

The first choreography of nearness we will explore unfolds as a reconfiguration of cancer—from a disease perceived as alien to the body, to something understood as a potential source of personal cure. While based in the trial protocol, this choreography unfolds in the clinic through interactions between doctor and patient.

In May 2019, Mie accompanied Dr. Emil, who was conducting his PhD study at CCIT-DK, to see Johan—a patient in his early forties who had just been admitted to the oncology department to enrol in a TIL therapy protocol. Johan suffered from an aggressive form of gastrointestinal cancer, which was already incurable at the time of diagnosis. Before Dr. Emil and Mie entered Johan's hospital room, Dr. Emil explained that Johan was extremely nervous about the risk of disease progression. For five weeks, he had been waiting for the T-cells, isolated from one of his multiple metastases, to grow into a potentially lifesaving treatment in CCIT-DK's sterile cell laboratory. During this period, he had, in accordance with the protocol, been left without active treatment. Answering Dr. Emil's opening question about how he felt, Johan looked intensely at him and said:

> I have stomach pain, and because I haven't had treatment for a while, I feel like I am being eaten up from the inside. I feel it [the cancer] is all growing! I wake up in the middle of the night thinking: Is something there?! I have no idea what this disease is like!

Johan's description of the cancer inside his body as a hostile stranger completely out of his control echoed most of the patients, Mie had interviewed or observed during her fieldwork in a Danish phase 1 unit specialised in genetically targeted anticancer treatments. In continuation with existing public and scientific discourses, where cancer is conceptualised as a foreign enemy (Reisfield and Wilson 2004; Sontag 1978), these patients unambiguously portrayed the deadly disease spreading inside their bodies as a dreadful "alien" "taking over" and "displacing" them from their own bodies. In the phase 1 unit, biopsies of the patient's metastatic cancer tissue were analysed to find the cancer-specific mutations that differentiated cancer cells from the patient's healthy cells, to identify treatments targeting these mutations.

Johan's experience resonates with the findings of Bogicevic et al. (2020), who argue that by emphasising the specificity of tumour DNA, genomic personalised medicine reinforces the notion of cancer as "a kind of non-self which needs to be fought" (Bogicevic et al. 2020, p. 8). In that sense, Johan's experience of cancer was not surprising. Yet his sense of being eaten "from the inside" reminds us that cancer cells are not, as with a virus for instance, a foreign organism intruding from outside the body's borders. Rather, as a molecular biologist working in the research lab at CCIT-DK explained in an interview:

> Cancer cells are the patient's own cells that have malfunctioned, and this may be one of the reasons why cancer is so extremely good at hiding from the T-cells. The tumour may not express specific antigens, and therefore, the immune system may not recognise the tumour as foreign.

That is, while the distinction between self and other is fundamental to both the narrative and the workings of cancer immune therapy, which is essentially about re-establishing the T-cells' ability to recognise cancer cells as non-self, the very development of cancer also escapes this well-established self/other antagonism (see also Swallow 2024). Although no longer identical to the patient's healthy cells due to cancerous DNA mutations, cancer remains genetically *alike* and *physically intimate* as it is growing inside the patient's own body. In this very material and corporeal sense, cancer can, drawing on Svendsen's (2022) notion of nearness, be understood as a form of 'near self'. However, this embodied nearness also enacts cancer as emotionally and imaginatively distant—*other*—from the human person it inhabits. The metastatic cancers affecting experimental patients are always inoperable and therefore incurable. Contained within the body, the uncontrollable growth of the patient's own malfunctioning cells threatens to overtake and eventually to kill the patient. As an inseparable part of the patient's body, metastatic cancer tissue is concurrently *too* alike and *too* close, provoking the uncanny and daunting feelings of otherness associated with cancer growth.

Yet, in TIL therapy, cancer tissue—infiltrated with T-cells—becomes the raw material of a potential personal cure. During fieldwork, Mie learned that patients

encountering this new treatment option accordingly ascribed new meanings to their cancer that "radically oppose taken-for-granted notions of cancerous tumours as unambiguously malign" (Llewellyn 2022, p. 174). This was particularly evident when patients referred by their local oncologist to CCIT-DK for TIL therapy did not immediately have an accessible metastasis large enough for surgeons to remove at least one cubic centimetre of tumour tissue. In a phone conversation with Mie, Dr. Thomas, an experienced clinical researcher at CCIT-DK, said:

> The patients who have been in that situation have had some very ambivalent feelings…they've hoped that their cancer would progress, so that they could get something [metastatic tumour tissue] out that could then be used for a treatment. And they've told me, that it's been a very strange situation for them, because ever since they got the disease, they've been hoping that it could go away, and now they're suddenly hoping that it will get a little bigger so it can go away entirely.

Dr. Thomas' reflections confirm what Llewellyn (2022, p. 174) unfolds in his ethnography of personal cancer vaccines developed partly from tumorous tissue, namely that personal immune therapies require patients and professionals to handle the "strange new paradoxes" that are brought into being when cancer is repurposed as a key ingredient in a personal cancer treatment shrouded with the promise of curing the incurable. The surgical practice of taking cancerous tissue "out" of the patient's body serves as a crucial part of the choreography performed to transform a deadly disease into a personal cure, and hopefully an incurable patient into a healthy person. That is, the procedure of physically distancing cancer from the patient's body is transformative as it enables a temporary emotional nearness between the patient and the accessible cancer tissue.

Paul, a man in his early 60s diagnosed with advanced thyroid cancer, was one such patient. One Tuesday in October 2019, Mie sat with Paul and his wife Oona in his hospital room. It was the day before Paul was to have his T-cells reinfused, and Dr. Emil and Nurse Lisa had just finished a medical check-up. Since enrolling in the TIL protocol 6 weeks earlier, Paul's cancer had significantly progressed, deteriorating his health and raising doubts about his ability to tolerate the TIL therapy. Despite his very advanced cancer and the intensive chemotherapy effectively wiping out his immune defence to make room for the activated T-cells, Paul felt a little better that morning. With great passion, he recounted that one of his relatives had, as an oncologist, witnessed the effect of this therapy in patients with advanced melanoma. Paul rephrased the words of his relative:

> I tell you, it's truly amazing to witness these patients. They were almost dead when they came [to receive TIL therapy], but after a couple of weeks, they walked out [of the oncology ward] cured, and they never came back.

Paul and his wife both seemed uplifted by these words, but as a former scientist, Paul knew that he was included in a highly experimental clinical trial testing the feasibility of an intensive TIL protocol across a range of solid cancers and that his chances of treatment effect were low. Nevertheless, when offered a slot in this

protocol, Paul had had no doubts about terminating the standard immune therapy that at best managed to slow down the relentless progression of his disease. He recounted that for a long time he had only had inaccessible bone metastases and had felt very fortunate when his scans finally revealed the accessible metastasis he had been hoping for. He further stated that it felt like he had been provided with "one last gunshot" [et sidste skud i bøssen]. In this way, Paul articulated his metastasis as some kind of personal ammunition. Like a gun, which can quite literally be considered an extension of its holder's arm, Paul viewed the metastatic tissue that could leave his body not as an inescapable and dangerous other that had come too close, but as an allied extension of (him) self. Rather than marking a final separation between body and disease, as is usually the case in cancer surgery, the practice of removing tumour tissue from the body it grew inside enables a different kind of *nearness*: intimate and agentive; the resected cancer tissue becomes a resource that allows advanced cancer patients like Paul to hope for a personal cure.

This practice of nearness-through-distancing extends into the laboratory work that follows the cancer resection. In the following section, we explore the carefully orchestrated procedures of isolating, activating, and expanding tumour-specific T-cells in the laboratory, before reinfusing these cells into the body of the patient as a bespoke anticancer therapy that is 'near self'. We tease out how choreographies of nearness are also choreographies of risk to vulnerable patients that extend from the lab to the clinic

Choreographing T-cells: when the personal cure holds the risk of patient collapse

T-cells are at the centre stage of TIL therapy protocols. Like the patients undergoing the clinical trials, T-cells are cared for in very specific ways. They are nurtured in the laboratory to grow according to a timed schedule and to a set size described in the protocol. As with the initial choreography (choreographing cancer), this part of the process also involves a series of risks for the patient, which may arise both in the laboratory and in the clinical setting. While Landecker (2007) has shown how the relocation of human tissue from the body to the laboratory—and its subsequent cultivation—estranges and objectifies human biological material, transforming it into a technological object, we demonstrate how the TIL infusion product becomes personal through expert cell culturing practices. That is, it is produced through choreographies that involve differentiating the T-cells from their embodied origin while keeping them sufficiently 'near' to remain compatible with the patient's body.

Six weeks before Paul and Mie's conversation in Paul's hospital room, Paul had a metastatic tumour surgically removed in an operating theatre at Herlev Hospital. Immediately, specially educated biotechnicians transported the resected material to the nearby sterile laboratory facilities at CCIT-DK. Here they cut the tumour into tiny fragments, which they then soaked in a dissolvent that enabled them to isolate the T-cells that had infiltrated the tumour tissue but were no longer sufficiently active to keep the cancer at bay. The biotechnicians then carefully distributed the T-cells in laboratory growth wells, providing them with growth media. In the following four

weeks, the T-cells were nurtured in an incubator set to 37°. Regularly, the biotechnicians made sure the T-cells had optimal growing conditions: they looked after them in the microscope, split them into more well plates when they needed more space, and changed their growth media to ensure they had enough nutrients. When the T-cells had expanded to the amount set by the protocol, the biotechnicians initiated the final phase of "rapid expansion". This included mixing the T-cells with radiated blood cells serving as 'feeder cells' and adding other substances to further activate the T-cells.

Much like the surgical distancing practice of removing metastatic cancer tissue from the patient's body and into the laboratory, the laboratory practices crafted a distance between parts, which were previously completely contained and impossible to disentangle from each other. Through the laborious laboratory procedures, biotechnicians disentangled the T-cells from the resected tumour tissue, and yet again this distancing practice was both connective and transformative as it enabled the T-cells to intimately interact with substances and professionals in the laboratory environment. This kind of careful, material nearness—created through the separation of cells contained in the same tissue—enabled the T-cells to 'soak up' various substances that proliferated and transformed them into what the director of CCIT-DK referred to as a "truly personal anticancer treatment", ready to be reinfused into the body of the patient from which it originated. What we see here is thus a version of 'the personal' that is created through distancing a part of the person's own body and cultivating and differentiating it elsewhere. This recursive movement—of distancing to enable nearness—offers a powerful analytical lens for understanding how cancer care is personalised through processes of separation, transformation, and return.

In the cancer clinic, the day of T-cell reinfusion usually had a special vibe, an intense and condensed atmosphere. Phones buzzed with good luck messages from the patient's family and friends, and pictures were taken of the vial containing the white matter of tumour-specific T-cells. Explaining the intensity of the situation in an interview, the director of CCIT-DK said:

> It's a reverent moment to get your [T]-cells, and it's something that we've been working on for a long time. A war is underway that must be won. It's very visual, and the patients recognise that fight.

Echoing the way patients explained their understanding of TIL therapy to Mie, she evoked the well-known biomedical discourse that constructs a clear boundary between the healing T-cells as part of the personal self and the cancer as a hostile non-self. Yet, her war metaphor also hinted that the patients are entering a battlefield and here, as we shall see, the material practice of T-cell reinfusion sometimes inverts this self/other antagonism.

On a Wednesday morning in October 2019, Mie took the lift to the oncology department on the hospital's 17th floor to meet the medical team preparing Paul's long-awaited T-cell reinfusion. Entering the oncology ward, Mie greeted nurse Lisa and Dr. Rebecca, a PhD student at CCIT-DK, who were together looking through the latest updates in Paul's medical record. Nurse Lisa stated: "He stands with one foot in the grave. Either this treatment can really make a difference

for him, or he doesn't have much time left". A few minutes later, Dr. Thomas appeared with a transparent bag of yellow-white matter in his hand. Mie knew that he had been to the cell laboratory to collect Paul's activated and expanded T-cells from a small double-windowed hatch. Dr. Rebecca immediately involved Dr. Thomas in the conversation, saying: "He [Paul] is not stable. I worry if he can even handle the [T-]cells". Dr. Thomas ended the discussion in which the three of them deliberated on Paul's respiratory problems and his significant cancer-related pains by concluding: "Now, we are standing with the cells. We must handle what comes and do whatever it takes to get him through".

This conversation conveyed the complex moral responsibilities faced by clinical researchers when deciding whether an advanced cancer patient remains eligible for experimental treatment (Dam et al. 2022). For Mie, it was evident that the decision to withdraw treatment becomes even more challenging in cases involving autologous treatments in which donor and recipient are the same person. The T-cell product—highly expensive and biologically unique—is quite literally "truly personal" and will be wasted if not administered to the patient-donor. Furthermore, such situations also evoke a sense of depriving the patients of something that is intrinsically 'theirs' and which may be potentially self-healing. Yet, as Paul's case poignantly illustrates, even truly personal therapies come with unpredictable and ambivalent properties in which care and harm cannot be neatly distinguished.

"Welcome home", Paul said, as his T-cell reinfusion began. He paused for a while before he added a question: If I have a fever, is it then a sign that my T-cells are working?" The way Paul greeted the substance that had started to flow into his body immediately made Mie think in line with the dominant antagonistic discourse in biomedicine that his special combat cells had been sent outside the body border (to the lab) to receive special training and now returned to their home (land) expanded in numbers and better equipped to recognise the molecules revealing the intruding cancer cells as 'foreign'. Yet, Paul's question about how his body would react to the T-cells and how to interpret this reaction also captured the ambiguous properties of the T-cells. When the T-cells were reinfused into Paul's body, expanded in numbers and activated by growth factors in the distant space of the laboratory, they were no longer identical to the body they originated from. Rather, these carefully choreographed laboratory procedures enriched and altered his T-cells into 'near self' entities: concurrently homely creatures enhanced to recognise and eradicate cancer inside Paul's body and foreign guests he did not know what to expect from.

As the T-cells started to flow into his body, Paul closed his eyes. Everyone in the room was quiet, and Mie, along with everybody else, noticed that Paul's body started shaking.

Paul: *I'm cold.*
Dr. Thomas: *He has shivering.*
Nurse Lisa: *Paul, I'll give you some morphine against the chills now.*
Wife Oona: *Are you cold? Are you in pain, Paul?* She sounded scared.
Paul: *Cold… No more painkillers…* Paul sounded as if he could only say the most necessary.

Nurse Lisa: *He's [oxygen] saturation is a bit low.*
Dr. Rebecca: *Give him a bit more oxygen.*
Dr. Thomas: *Give him 50 mg more* [morphine against the shivering].
Nurse Anna tucked another blanket around Paul's shivering body, but the shivering was still getting worse. "*Arrrggg!*" He exclaimed. He rattled now. His wife turned her head away. She can't take it anymore, Mie thought to herself.
Oona (whispering): *Why does he sound like that?*
Dr. Thomas: *It's because he can't spit up the mucus. The T-cells settle on the lungs.*
Dr. Rebecca (calling out): *Paul, Paul!* Paul looked like he was no longer fully conscious.

Even if Dr. Rebecca had carefully explained that this is how the body may react to the T-cells, it was appalling for Mie to experience how Paul seemed to be invaded by the T-cells he had welcomed home as part of himself. The distance between Paul and his cancer-derived T-cells, which were crafted by surgical and laboratory procedures, did not only enhance the T-cells' ability to kill cancer. The procedures simultaneously increased the risk of the T-cells attacking the embodied patient. When that happened, the patient's own T-cells no longer acted only as familiar yet enhanced near self entities; they also became 'other'. In other words, the physical nearness of these T-cells—introduced into the body as a personalised therapy—suddenly became a source of acute danger.

Life-threateningly ill patients like Paul enrol in experimental TIL therapy, aware of the acute risks to their weakened bodies, because they hope their enhanced T-cells will recognise and destroy the deadly cancer cells once and for all. While the chances are low, there is a possibility that the individual patient will be among the few who leave the hospital "cured and never come back". Our analysis has thus exposed both the viable and the lethal potentials of TIL therapy. We argue that these potentials and risks and the moral dilemmas they bring about are created as the patient's bodily materials (cancer tissue and T-cells) get reconfigured as neither self nor other, but as 'near self,' through careful choreographies that differentiate these materials from their embodied origin.

In other words, we have shown that autologous anticancer therapies—in which donor and recipient are the same person—raise new questions about where, when and how bodily material comes to belong to the personal self and complicates the notion of the personal as inherently safe and effective. As we will explore in the final section, not only the patient's bodily material, but also the very patient from whom these materials originate are ontologically and morally reconfigured by the choreographies of nearness that constitute TIL therapy.

Choreographing the patient: unique person and temporary container

For several days Paul's medical team, which now also included a physiotherapist, a pain specialist, an oncologist specialised in cannabis treatment, and psychiatric support, did their utmost to get Paul stabilised. During these incredibly tough days, the

"truly personal treatment" threatened Paul as a person. Like the premature piglets and infants in Svendsen's ethnography, Paul appeared as a liminal being. Devoid of the usual markers of personhood and agency, Paul was, as his wife Oona anxiously repeated, "no longer himself". He was bedridden, he went in and out of consciousness, and when he was awake, he was confused and disoriented and could barely speak. He was unable to eat, he received his fluids through the vein, and he had to wear a diaper. Everything that went in and out of his body was closely monitored and described in his journal. Through an arsenal of medical interventions, his team of nurses and doctors worked to sustain his blood pressure, his oxygen saturation, and other vital functions. In every way the team did, as Dr. Thomas put it, "whatever it takes" to get Paul "through". Choreographies of nearness in this part of the protocol involved caring for Paul to re-enact him as a unique individual person suffering from the invasive procedure of T-cell reinfusion, while at the same time caring for the T-cells and their scientific value.

Paul and his fellow patients were at the centre of the everyday care practices through which the medical team struggled to make their bodies sufficiently contained to both absorb and secrete the fluids, nutrients, and drugs needed to keep them alive. While usually referred to as 'T-cell patients', we noticed that sometimes the health professionals would refer to these patients simply as "the T-cells". For instance, they asked a colleague "how are the T-cells doing?"; or they wrote in the medical record of a patient that "the T-cell has to be moved into isolation tomorrow"; or they presented themselves over the phone saying, "I am doing the medical round on the T-cells today". To the health professionals, this nicknaming practice was just a practical abbreviation. However, the nicknames can also be analysed as an emphasis of the more-than-personal character of TIL therapy patients as both T-cell patients and T-cell containers under treatment.

One afternoon, twelve days after Paul's T-cells infusion, Mie went with Dr. Emil from Paul's bedside to the outpatient clinic. Frustrated with Paul's medical situation, which repeatedly forced the medical team to deviate from the study protocol, Dr. Emil said that he would have preferred stricter inclusion criteria. He considered that such criteria would have made it easier to exclude patients like Paul. Including patients in poor health, out of empathy with their strong desire for treatment, is not only risky for the individual patient but also jeopardises the study. Painkillers and other medications may interact with the clinical outcome of TIL therapy in unknown ways, and when the patient has many symptoms, it becomes difficult to distinguish between disease and treatment side effects. Dr. Emil recounted that while the first approximately 25 patients in his study had had manageable side effects, his last 2 patients had ended up in the intensive care unit. Now he worried that Paul risked being the third. If this had happened with the first patients he included, the director of CCIT-DK would probably have had to discontinue the study, thus depriving future cancer patients of a potentially beneficial treatment option. Dr. Emil concluded:

> That's why, I will also be going to the lab. My PhD project can't just be this clinical study. Here [in the clinical study] my results will probably just show that it [the protocol] is feasible, but that it [the treatment] doesn't have an effect in these patients. Then I'm going to the lab to look at: What do the [T]-cells

actually recognise? Is there something we can do to make them work better? So, there must also be some *real* research in my PhD.

In this way, Dr. Emil articulated the view—echoed by several researchers at CCIT-DK—that cell research, conducted in the controlled environment of the laboratory, is more "real" than clinical research. Often, in translational research, laboratory researchers worry that their results—for instance from standardised animal experiments—will not be robust enough to replicate in messy clinical situations, which are then referred to as the "real" world (see also Dam et al. 2017). In Paul's case, however, it was now clear to Dr. Emil and the medical team that Paul was terminally ill. He would not be among the patients who "walked out [of the oncology department] cured", and furthermore that the data he would contribute to the clinical study would be confounded by his complex medical condition. For Paul as an individual, the choreographies of nearness of the TIL therapy protocol did not have a successful outcome. He died from his cancer about a month and a half after returning home.

The choreography work was, however, still successful in terms of contributing to the continued development of the protocol. Paul's T-cells—initially harvested and harnessed as enhanced near self instruments to prolong his life—held an infinite future in the laboratory, endowing them with scientific and translational value. Throughout the clinical trials at CCIT-DK, tumour material and blood samples were collected from each patient and frozen for later laboratory analyses. These analyses aimed to assess the ability of T-cells of individual patients to recognise and eliminate cancer cells, correlate these findings with the patient's therapy outcome, and propose modifications to future clinical study protocols to the benefit of future patients.

In this translational research trajectory, the present patients were always treated as unique individual persons (originals) (Hogle 2022) with rights and autonomy, yet they also acquired a second identity as temporary (replaceable) containers (Franklin 2007) and facilitators of intimately near interactions between the enhanced T-cells and the cancer cells populating their bodies. In this process, the T-cells assumed the status of being the "real" subjects of scientific and translational interest, the originals to be investigated and worked upon in the laboratory long after Paul and other patients in experimental cancer care had passed away. Importantly, however, the ontological status of patients as both research subjects with instrumental scientific value and as unique dying persons holding intrinsic value, was not in opposition (see also Bogicevic and Svendsen 2021). Rather, to the patients we have followed, engaging with experimental TIL therapy represented one last opportunity to resist a situation described by cancer patients in experimental care as "sitting and waiting for death" (Dam et al. 2022, p. 351). Drawing on Cussins (1996, p. 576), we may say that patients in experimental TIL therapy manifested agency and 'self' through their objectification as research subjects. Yet, to do so, patients along with professionals had to navigate in complex and risky choreographies of nearness, enabling 'selfness' to coexist with otherness.

Conclusion

This article has explored the practical and material configurations of the 'person(al)' in protocolised tumour-infiltrating lymphocyte (TIL) therapy—a promising cancer immune therapy in which immune cells isolated from the patient's cancer tissue are used to eliminate otherwise incurable cancers. Developed for one individual patient, such cell-based immune therapies are epitomes of personalised medicine—an approach to healthcare portraying treatments tailored to the individual as more effective and safer than the standardised 'one-size-fits-all' treatment approach. In this article, we have complicated this narrative.

Drawing upon ethnographic fieldwork from experimental TIL therapy in Denmark, we have documented how patients and professionals involved in TIL therapy enact the intimate relationship between cancer tissue, immune cells, and the embodied person from whom these bodily materials originate. We have done so by bringing with us insights from the longstanding interest and focus of Science and Technology Studies (STS) and medical anthropology on investigating the material semiotics of experimental and clinical practices in detailed empirical studies. In this way, our analysis also engages with recent feminist STS scholarship in cancer immunology, which has called for more nuanced social framings of body and disease. By paying attention to practices and materialities, this feminist approach disrupts the dominant discursive self/other antagonism of oncology and immunology, which portrays cancer as a dangerous 'other' and the immune system's T-cells as part of the personal 'self'. A commonality between these lines of research has been to focus on practices that link the laboratory with the clinic in innovative ways to study the implications these new configurations have for everyday practices as well as the politics of these practices.

In this article, we have analysed how cancer tissue and immune cells originating from the same individual are made to oscillate between being part of the self and being other, all in the service of creating a personal cancer cure. As tumours were removed from the body they grew inside, immune cells were isolated from the tumours they had infiltrated and activated and expanded T-cells were reinfused into the patient, this bodily material was neither enacted as entirely 'self' nor entirely 'other' but as 'near' the embodied person from whom they originated. By extending Charis Thompson's concept of "ontological choreography" through Mette N. Svendsen's notion of "nearness", we have introduced 'choreographies of nearness' as a conceptual tool for analysing how experimental autologous therapies dissolve the ontological and ethical boundaries of the person(al). These choreographies—choreographing cancer, choreographing T-cells, choreographing the patient—materialise not as linear or stable procedures but as recursive, distributed, and ambivalently affective practices. They are practices in which selfness and otherness, care and harm, hope and risk are not opposites, but co-present and contingent. Protocols such as those governing experimental TIL therapy are thus not only logistical devices, but complex moral and epistemic infrastructures through which forms of life are sustained, transformed—and sometimes lost.

'Choreographies of nearness' opens a way to analyse how experimental and highly personalised therapies are deeply relational endeavours, where the distance involved in being 'near self' holds powers that are not only benevolent and productive but also unpredictable and dangerous. In this way, the article contributes to ongoing debates in medical anthropology and STS on the material semiotic practices of personalised medicine, and the epistemic, ethical, and affective dimensions of emerging biotechnologies.

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Declarations

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

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Mie S. Dam is an assistant professor in the Centre for Medical Science and Technology Studies, Department of Public Health, University of Copenhagen. Through ethnographic fieldwork, her research addresses the ethical, social, and political aspects of personalised medicine and its translation across laboratory, clinic, and patient lives.

Tone Druglitrø is associate professor in STS at TIK Centre for Technology, Innovation and Culture, University of Oslo. She has published on model organisms in biomedical science with a special focus on biopolitics, standardisation, and care. She is currently leading a project exploring innovations in the more-than-human condition of immunology.