



Low expectations within conservative wing of discourse coalition for innovation and technoscience: integrating vanguard visions to therapeutic consent

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Abstract

Drawing on the sociology of expectations, this paper inquires what objects, promises, and audiences are invoked in two examples of biotechnology discourse on organoids, MCELS (Multicellular Engineered Living Systems) in the USA and RE-BIRTH (From REgenerative BIology to Reconstructive THERapy) in Germany, and how that affects therapeutic consent. Therapeutic consent discussion in the literature has been focusing on singular discourse on the objects of biotechnology. This paper focuses on making of organoids embedded in two very large research projects of biotechnology in two comparative cases to fill the gap between cultures of imaginations and discourses. The paper claims that (a) both projects are connected through shared objects within vanguard visions joined through a discourse coalition. The discourse coalitions that are making them further can be connected at the object level both by the low expectations and the techno-scientific imaginaries that are more relevant to public imagination by nested frameworks of vanguard visions and sociotechnical imaginaries. This connection is necessary for the object to be considered within the research and development of the object, whereas when the research programme is finished and the object itself is delivered, the low expectation and the calibration thereafter is dependent on this network (b) When the object [organoid] itself is a research object and a part of a discourse coalition is and an applied healthcare object at the same time, lowering of expectations and recalibration of the higher expectations are necessary for debates around consent as *enabling conditions of consent* in the very first place.

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Introduction

Recently within the STS literature, there has been a call for increased attention for sociology of low expectations, following mostly Gardner et al. (2015). Gardner et al. (2015) use the example of Deep Brain Simulation (DBS) as recovery technologies as examples of sociology of low expectations within research. They position it within “political economy of hope” research, which points out that biological citizenship is the main structure shaping the form of expectations (Novas 2006; Brown 2015). Although within the low expectations framework, it is rightfully claimed that the “recalibration” for the individual patient is an important element, understanding the development of the intervention technologies, I will argue that these technologies still require vanguard visions of Hilgartner (2015) and sociotechnical imaginary at large of Jasanoff (2015), due to the promise of technological novelty of the techniques of intervention. In other words, the technological infrastructure that low expectation recalibration targets still move within broader societal vanguard visions and technoscientific imaginaries.

As a practical example of the above framework, I will present two different research cultures in the making of biotechnology, MCELS (Multicellular Engineered Living Systems) [<https://m-cels.mit.edu/>] in the USA and REBIRTH (From REgenerative BIology to Reconstructive THerapy) [<https://rebirth-hannover.de/en/home-en/>] in Germany and will compare their respective discourses. I will do this through the aid of philosophy of science research on the making of objects. in Germany and will compare their respective discourses. I will do this through the aid of philosophy of science research on the making of objects.

Method

The paper first gives a detailed account of sociology of expectations literature and draws relatable parallels to the discourses around organoids. Secondly it uses a case study approach within the understandings of science and technology studies, particularly on techno scientific imaginations. My analysis is based on a non-systematic review of publicly available promotional materials and events for both programmes, including websites, publications and public engagement meetings to describe the imaginations around the organoids within these two largest programmes of the countries that they are based in. I have checked the web sites of both programmes for MCELS; <https://m-cels.mit.edu/>, for REBIRTH, <http://rebirth-hannover.de/en/home-en/> I also attended MCELS public engagement events, read through key publications of REBIRTH and MCELS to understand the research structures and the meaning of their terminology. Each programme is then compared as a contrasting case study noting their research structures and choice of terminology. Following the previous analysis of the concept of organoid (Altinok 2023), I will argue that both recalibrated and not recalibrated versions of technoscientific expectations constitute different wings of the same discourse coalition. Organoids, entities that are supposed to resemble organs for both clinical and therapeutical purposes (Paşca et al. 2022) are used in both frameworks, in MCELS more oriented towards bioengineering use, and for REBIRTH, more clinical use. Each programme is then compared as a contrasting

case study noting their research structures and choice of terminology. Following the previous analysis of the concept of organoid (Altinok 2023), I will argue that both recalibrated and not recalibrated versions of technoscientific expectations constitute different wings of the same discourse coalition. Organoids, entities that are supposed to resemble organs for both clinical and therapeutical purposes (Paşca et al. 2022) are used in both frameworks, in MCELS more oriented towards bioengineering use, and for REBIRTH, more clinical use.

For the sake of brevity, I will call the general discourse coalition “biotech”. In both case studies, I will take the discussion to the field of objects in the making, particularly those without regulation (Haddad et al. 2013), and will agree that this brings about challenges of practical use. With respect to these technoscientific objects, the doubt in the “use” of the technologies of intervention with an adamant belief in engineering technologies, makes the object side of the innovation of technoscientific imagination up. The expectations that are embedded within the function of the objects are being carried through an entity realism towards the objects, by being conceptualized in a way that is relatively context independent, or context free. Overall, this case shows that, since there being many different kinds (as in directions or ways) of solution, and high expectations through vanguard visions being the norm of everyday life in techno scientific societies, such “attractive” high level promises (Brown and Michael 2003) might be necessary as well within the general structure of promising, fulfilling the task of the dual nature of expectations of technoscience in action, requiring calibration always within its *modus operandi*. This result integrates the sociology of low expectations research with philosophy of science to calibrate the objects in the making.

Finally, I will move toward the practical aspect of the addition of low expectations meeting technoscientific imaginaries at the object level. This undercuts the distinction between research and application in this regard. Technologies seem to mean different things for different publics, the researcher, public funding domain, and for the application, patient—practitioner domain. I will then briefly investigate the clinical ethical aspects of positioning the patient’s vision of the possibilities of technology as an important element in the patient’s vision, which has been identified as the enabling element of consent. (Pickersgill 2011).

In short, my analysis will end with a remarkably similar perspective to the literature of “regimes” as used by Gardner et al. (2015)”, however the following addition: recalibration does not need to be a separate process but can exist in a discourse coalition that combines visions, imaginaries and expectations differently in different constellations.

Expectations and low expectations discourse in medicine

In the literature of sociology of expectations, expectations are seen as performative, in the sense that they *do* something instead of simply depicting the state of affairs. Expectations in this way take part in the change or creation of reality (Guice 1999; van Lente 2012). This is possible through transformation of a vision to an imperative. Van Lente (1993, 2000) has argued that such transformation of a promise into

a requirement is a central mechanism in the dynamics of expectations: called as the ‘promise-requirement cycle’. But what is required from whom, and what is promised to whom is not analysed in detail, instead the performative direction within a coalition is considered the core of the framework. Or in short; “Expectations constitute ‘the missing link’ between the inner and outer worlds of techno-scientific knowledge communities and fields” (Borup et al. 2006, p. 286). Because of this feature, the domain of expectations is a great space to broker different concepts form coalitions and communicate with each other in different ways.

On the other hand, this large area of brokering concepts and communications left open, the critique of the “low expectations” literature, a literature which is an extension of the sociology of expectations. It is based on the claim that sociology of expectations has been shaped largely by the projects of positive understandings particularly within the field of Deep Brain Simulation and the positive outcomes of such projects which might in fact be rare, and research centred projects. Within the field of low expectations; Gardner et al. (2015) cite various authors to show sociology of expectations has studied how “future-oriented discourses” have influenced research (van Lente and Rip 1998; Brown et al. 2000;¹ Borup et al. 2006; Brown and Michael 2003)

They also state that the expectations are taken to be expectations of people as public towards bigger projects. With the previous example of DBS, they correctly point out the problem of holding onto certain hopeful example within the vast possibilities of outcomes for the patient. However, the second point, about the stereotypical example of expectation, the balance between the critique of hype and the delivery of developing technologies should be more carefully balanced. Based on their framework, I will argue for the necessary interrelation of different kinds of “regimes” with respect to two different kinds of roles of the patient as a member of the public sharing her imagination, and the patient who needs to relate herself to her actualized outcomes of the treatment.

Gardner, Samuel and Williams’s (2015) main contribution in this sense is their restructuring of an understanding of low expectations based on many successful works of sociology of medicine, and biopolitics. At the core of sociology of low expectations is Gardner et. al.’s main insight of two distinct kinds of logics which are defined as “regimes of hope” and “regimes of truth.”: “The former is characterized by the optimistic perception that research activities are warranted by the promise of a high-reward payoff such as a miraculous cure. The latter, on the other hand, is characterized by “the investment in what is positively known, rather than what can be,” and the belief that “most medical therapies are less effective than claimed” (p. 67) Biomedical endeavours are constituted by aggregates and modes of organizing that follow either or both of these logics: prospective patients, for example, are rallied by hope, while regulators and patient support groups may be rallied by “truth.” Tutton suggests that biotech companies move back and forth between the two regimes, and the work of Fitzgerald and Pickersgill suggests that researchers and clinicians can

¹ In one of the first contributions to the sociology of expectations, *Contested Futures*, Brown et al. (2000) distinguish their position within *Contested Futures* from another recent book, *Clinical Futures*, which was published by physicians reflecting on the futures of clinical care.

occupy some sort of intermediate position by drawing on understandings from both.” (Gardner et al. 2015, p. 1003)

As in their depiction, drawing the parallel from Moreira and Palladino (2005), there are two different regimes, which are leading into two different directions. The hopeful image, “regime of hope” is to a certain extent also is a regime from general to the particular. I mean this general—particular relationship with respect to the clinical outcome differing for every patient whereas the shared image of the optimistic future being more general. Pickersgill (2011) points out that the scientists within neuro-technological interventions research do not agree on a general regime of optimism. He also draws in the same source of the distinction between two different regimes, regimes of hope and truth which are shaping contemporary biomedicine; “a simultaneous hope for new treatments, burgeoning from neuroscience research, that will ameliorate the ‘problem of personality disorder’, and an investment in the day-to-day truths of clinical practice..” (p. 460)

Upon Pickersgill’s clinically relevant analysis of recalibration, Gardner et al. (2015) exemplifies the use of the concept of recalibration, not only as a practical tool within the clinic but as a management of different regimes. “Recalibration involves, we argue, enrolling patients and their families in a regime of truth, in which the likely benefits of DBS and its limitations, are rendered explicit.” (p. 1004) After pointing out the developments in sociology of expectations, they start critiquing the mainstream “sociology of expectations”. Their critique, after building their theoretical framework partially around Brown and Michael (2003) is on the “high expectations” of medicine. They criticize Brown and Michael (2003), claiming that Brown and Michael (2003) direct attention only to the importance of “attractive” high level promises of research structures. And finally, although they also reflect that within research environments, negative expectations are very much present, and not only present but influence the thinking of the people within such projects. This becomes particularly prevalent at Fitzgerald (2014), as he argues that negative expectations are not only present, but also important in “for the maintenance of some particularly ambiguous neuroscience projects” (p. 242) I agree with this aspect of the phenomenon as a more generalizable rule for developing technologies in general.

As I will show using the case studies below, this view should not occlude the fact that even low expectation research must meet the societal demand for imaginative acts of justification. And furthermore, this justification itself is extended beyond the clinical, even to objects themselves through the dynamic of research discourses. Research discourses have a heavier emphasis on technologies in the making of such objects, in which the objects have multiple characters and are connected strongly to the not only negative perspective of the more clinical wing of the research but also the more optimistic imaginaries of the researchers. On top of low expectations analysis, all research “surfs” through a wave of imagination that can be conceptualized around techno-scientific imaginations of different sorts. Jasanoff and Kim (2015), recommend empirically mapping the “sociotechnical imaginaries” that circulate in and around technoscientific practices. It is also argued that expectations and ‘promises’ as well as ‘visions’ (Hilgartner 2015) are overlapping but expectations have a higher degree of their enacting and subjectively normative character, and expectations thus fulfill a more performative character (Borup et al. 2006). I will not go into

this discussion whether expectations and promises are fulfilling the same function but suffice it to say that since the cases that I will discuss here have quite wide-ranging structures and functions.

In short, Gardner et al. (2015) challenge the general network of promises and the necessity of the over optimistic constructions of future within technoscience, particularly that of Brown et al. (2000). However, I think there is still need for both the particular vision at the given clinic and the patient as member of public's general vision of technoscience. This could be used for the image to the society, the patients, researchers, and the image of what and to whom is the next question, as the researchers are also carrying such recalibration within their cultures of regulations and research.

Discourse coalitions around organoids; research question (a)

I will now turn into looking into two research projects which are employing the same bundle of objects to see how at the research level low expectations framework needs complementation. I have chosen these two large research projects since they both use the same object coalition (organoids) while having different embeddedness of the object in expectations and practices. Organoids are, among expectations around them, are objects that are built for research purposes to mimic certain functions of organs based on the expected role or study. As the sociology of expectations is highly dependent on the framework of innovation (van Lente 2023), which is also object related, talking about research structures with their similarity with respect to objects is an accurate way to analyse the two research programmes further. Moreover, these to large research programmes are the main drivers of research on organoids within their respective countries, creating a good sample for embedded expectations and promises within those countries.

So far within the literature, the emphasis has been on clinical recalibration and turning into a regime of truth within this context. Although this makes sense from a clinical perspective, seeing ethics only as clinical application of a given technology is making sociology of low expectations neglects research ethics. Using the following case studies, and how they do align with respect to different research cultures, helps us to contextualize low expectations within international vanguard visions. Since the biotechnological object—organoid—is the same within discourses, how different national and international levels are connected differently to clinical care and the patient imagination helps me to connect sociology of low expectations with the literature on vanguard visions and technoscientific imaginaries. This is the main reason to develop this paper around organoids. Zhao et al. (2022) provides many criteria for a biotechnological entity to constitute organoid, but they do that within a more promiscuous concept of organoid, and they point out subcategories of organoids as combination of some elements of being of “that organ” and the engineering, or artificial and purposeful element of the more generic definition.

Geels and Smit (2000) argue that because of their low performance characteristics, new technological developments cannot directly be set to the market. They need to be protected and further innovated before. They mention the funding purposes for the

existing of these safe spaces, as well as the time to set agenda for technical—political alliances. Organoids are falling under this category. In addition to their concern, the discursive space for biotechnology is similar in the sense that before having the legitimacy for even further visions, they need to make space for themselves in the conservative health related discourses as being their hopeful part of them. Although the realist approach to expectations needs a gap between the real and artificially inflated values, while constructivist takes them as an essential element within the decision making of all actors (Borup et al. 2006). For biomedical technologies, the observed medical difficulties can play a vital role both as an example to realistically inform the researchers and the “elite” actors, while it can also give them more confidence about their particular technologies, thinking that it will overcome the existing difficulties or bypass them. Whereas, similarly Berkhout (2006) sees collective expectations as bids which can be used to align research and research products within a research space. Sociology of low expectations does not distinguish between patient as the patient undergoing clinical trial, and patient as a member of public who lives through technoscientific imaginaries. Whereas as I argued in the previous part, it is very successful in analysing the patient experiences within clinical settings. The large expectations (such as development of complete artificial organs, return to the original function of a limb regardless of the level of damage) of technoscientific imaginaries are intergenerational, industry led visions, due to profitability of such visions, and the driving expectations can force other research to pretend to follow that discourse. This is the reason why different imaginations and expectations are sitting at the intersection of such bids and taking part in the positive feedback in developments of organoids. Such large expectations from biomedical technology can be read through *technoscientific imaginaries* of Jasanoff (2015). She describes them as “collectively held, institutionally stabilized, and publicly performed visions of desirable futures”. I will look for the making of such imaginaries within research. Imaginaries in this sense not only influences the level of ethical frameworks but also objects, and the selection of objects that fall under the expectations. The argument is, although calibrations of expectations are needed, the more main narrative is embedded in the infrastructure (Deuten and Rip 2000) of being able to speak within expectations and entangling of technological outcomes (van Lente 2012), the more attention should be given to the visions and imaginations that enable low expectations. The regimes of truth here intertangles with the regime of hope within the general coalition of making of the discourse “biotech” that brings about the group of organoids. Organoids in this sense are not clearly defined objects (despite many trials by some experts in the field) but a discourse coalition due to falling into different regimes and expectations. A “discourse coalition, in short is “ensemble of particular storylines, the actors that employ them, and the practices through which the discourse involved exerts its power” (Hajer 2009, p. 64). I will take the discourse coalition of organoids’ both wings here, while claiming the discourse coalitions around “organoids” as “biotech”. In this sense, the discourse coalition is building the infrastructure of the expectations. As Deuten and Rip (2000, p. 67) argue “Analytically, the important point about infrastructures is that they help to explain how coherence and linearity can emerge in multi-actor, multi-level processes, without any one actor specifically being responsible for it.” Vanguard visions, thereby provide the infrastructures in which expectations can move.

This part (3) will see the concept of organoid, and the development of the discourse coalition around them not through the perspective of patient, but patient as a member of public who shares the vanguard visions. Actual patients are largely lacking from these frameworks; therefore, I will introduce them only as partners as recipients of visions. Vanguard visions (and overly optimistic outcomes) are likely to be even stronger for patients considering that they are an already selected class as the patients who decided for getting treatment.

MCELS

Observations

MCELS is funded through the US-based National Science Foundation, started with 30 researchers in the development of their projects. The centre of the group has organized workshops in 2016, 2018 and 2021 and even public engagement events in 2022. Although mostly North America based, with a heavy emphasis on Boston area, they are collaborating with several other institutions within Europe as well. The coalition is big enough to fund “centres for MCELS” such as the one in MIT. I see MCELS within the coalition “biotech” as coalition biotech’s “vanguard wing”. This way, I claim that they are more fitting to the “vanguard visions” of Hilgartner (2015) as they make the “development of technology in unexpected ways possible”.

One of the landmark papers of MCELS, Kamm and Bashir (2014), is titled “Creating Living Cellular Machines”. Their aim, stated as such within the paper summing up their activities for the research group, is the making of the cellular machinery, that includes organoids. The expectations surrounding them are far from clinic and rely more on the visions in the sense that they relate themselves to possibility. Here, it is possible to see the language with relationship to general discourse within the language of life. However, with a slight transgression in the sense that, they already transgress the boundary by imagining life as machines. Machine-based metaphors in synthetic biology (expressions like ‘genetically engineered machine’) has been shown to detach the clinical related ethical questions from the object as well (Boldt 2018). Such metaphors and the keywords such as synthetic biology are abundant in MCELS. I will come back to this multi layered approach of the research programmes and their necessary audiences in section “[Making of the High Expectations, Around the Same Object](#)” (below). Methodologically, their main set of methods include culturing of stem cells, myocytes, endothelial cells, or neurons (mostly mammalian) into cell clusters, which are then assembled into larger objects which have some useful higher-order function, like mechanical contraction, tissue vascularization, or sensory response. While doing so, they put the already existing disciplines in the making of their own. The novelty they promise amongst the traditional methods in the established biotechnology are based more towards the technologies that they are aiming to develop. Their aim in this regard is the creation of novel objects at unprecedented scales.

Interpretations of findings

Moreira and Palladino (2005) observe that the two distinct regimes and their unbridged differential methods and domains also pose a strong challenge to two distinct kinds of reasoning. They argue for the biotechnological projects from engineering domain can appeal to living through a technical approach.

“Stem cell technology would seem, however, to provide a technical solution to these ethical problems (these ethical problems being mostly the ethical problems due to politics of life and politics of death occupying different accounts). In fact, the prospect of initiating the ‘self-repair’ of the brain with undifferentiated and pluripotent cellular tissue would seem to offer a definitive closure of the ethical problem” (Moreira & Palladino, p. 66, parenthesis commentary is mine)

Their argument is that the distinction between politics of death and the politics of life can be maintained through the acceptance of “self-repair” which is different from enhancement, manipulation, or artificial for that sake. What we see within the discourse coalitions around organoids is exactly a “solution” or more accurately, being hyped of a vision of a solution to this problem. The vanguard vision within “biotech” discourse coalition can effectively be present. In this sense the “project organoid” and the research structures built around organoids are embedded in a discourse culture in which both the politics of life and death can take place, within the promised web of visions. Overall, the conceptual framework of sociotechnical imaginary of Jasanoff (2015) are due focused on desirability of the future outcome and the MCELS is heavily focused on a structure which was based on engineering. This concept can be observed in two distinct levels, first through the structure’s inclusion of engineers at key decision making positions that structure research and second, epistemically through both language and the techniques as well as the elements that they are overlooking through the interdisciplinary web that they are building. This way, they are an easy fit for technoscientific visions framework since they can be easier publicly held due to their freedom from other disciplinary structures. MCELS in this sense, represents the visionary wing of the “biotech” discourse coalition around organoids.

Since it lacks the connection to the clinic it cannot carry the regime of hope in the traditional sense, but instead it shows its research capacity through engineering projects such as “biobots” (Sample et al. 2019) within public imagination. This way, the patient as a member of the public can preserve another kind of optimism of an abstract kind as the successful “biotech” discourse becomes more believable and relatable for her. In this sense, from the perspective of the patient, patient *vis*—a *vis* public is participating, or at least is a candidate to participate within vanguard visions, which is one necessary wing in the making of organoids.

REBIRTH

Observations

Based in Hannover, Germany, REBIRTH is an “excellence cluster” [Exzellenz Cluster], the biggest body of research structure that can be supported by the federal government of Germany. The 15-year financed cluster uses biotechnological methods varying from iPSCs (induced pluripotent stem cells) to CRISPR/Cas-based genome editing (Drakhlis et al. 2021). With respect to methods of biotechnology, the kinds of tools that are used to produce biotechnological objects are not very different from MCELS, however, the discourse towards the clinical aspects is very prevalent in REBIRTH within the structure of the cluster, its discourse and key figures. As a matter of fact, organoids exist within REBIRTH which is aimed at organ-based therapies. Because of this reason I will position REBIRTH as the “conservative wing” of the discourse coalition of “biotech” around “organoid”. My judgement on the structure of REBIRTH is heavily based on the publicly available representations of their own projects, such as their own web site and funding applications. (<http://rebirth-hannover.de/en/home-en/>)

The aims of parallel lines of work in the making of organoids for example consists of building organlike structures heavily within many different aspects of the research presentation to the scientists, publics and researchers alike. The techniques are bundled together to make more lifelike conceptions, livers, or hearts for example for both experimental and therapeutical purposes (Sgodda et al. 2017). On the other hand, the engineering part, the interdisciplinary structure, detached from life to produce a design that is embedded in vanguard visions of technoscience is not very prominent in their self-representation, and research. This is due to this direct connection on multiple levels of existing structures of research, departments and disciplines. The pivotal point of the conceptualization in REBIRTH is on objects and functions such as “biohybrid devices”, “biofunctionalization”, “organogenesis”. In this way they are pointing towards a “natural” way of building organs, and “regeneration” which can be directed to the clinic. Within the research cluster there are also many medical doctors, and several key positions are also around major medical doctors, which make them strong in decision making processes as well as conceptions and framing of these projects. This way, the performative function of such visions in the making of organoids becomes directing them into a role in therapy.

Compared to MCELS where engineering holds a more central position it is to be expected that the more practical aspect at least with respect to the clinic is more prevalent within this program. Drakhlis et. al. (2021) show that they are in the process of developing organoids that could form hearts to be implanted. As in this example, it is hopeful in the sense of clinic, but not “visionary” in the sense that it promises some form of regeneration rather than creating new imaginations itself. The research programme is divided into subsections of basic sciences in regeneration, regeneration in disease models, regenerative technologies, and clinical translation & regenerative products. This structure of division of the cluster itself is very much directed towards clinic and clinical regeneration, placing it within a regime of hope, however without being within vanguard visions due to conservative character of the clinic. Although

regime of hope is prevalent in both programmes, I think MCELS has a more “public” presentation that is linked to many members of the public with respect to “visions”. I take imaginaries and vanguard visions to be parts of same process within public interpretation of the technology.

Programme/representations	REBIRTH	MCELS
Object	Organoids	Organoids
Visions	Mature	Vanguard
Imaginaries	Regenerative/maintaining the life— nonlife boundary	Generative/ undermining life—non life boundary

Interpretation of REBIRTH as “conservative”

I will distinguish between regimes of hope and truth within REBIRTH. Hope in this element is the hope of the visions from larger projects as brought upon through organoids’ vanguard vision of success, whereas the truth is sustained by what is already explained as different wings of the discourse coalition (Author 2023). Whereas one such research, REBIRTH, is aimed clearly at therapy through the employment of same objects, (“biobots” and “organoids”) follow different kinds of promises. The mention of life exists here through other parts of the discourse coalition within the “conservative wing”. This becomes more prominent in the distinction between the development of novel object, and the usages of them. Established disciplinary barriers seem to be “respected”, “rigid” and protected in REBIRTH, compared to MCELS, which makes it easier to be categorized through the duality of regimes, whereas this also highlights that the optimistic vision within the regime of hope from MCELS is a more prevalent force in the general thinking and can make the recalibration *subsumed* under larger visions, in this example the visions of technoscientific imagination. The performative character of the expectations or imaginations are bypassing those barriers within MCELS, while within REBIRTH these barriers are helpful to organize the research agenda. I find this similar to what Garner et. al. argue for within political economy of hope;

“Studies on the “political economy of hope” have illustrated that the management and appropriation of hope is implicated in a form of biological citizenship, in which empowered citizens actively engage with researchers and clinicians, share patient experiences, and make use of the media (Novas 2006; Rose and Novas 2005; Brown 2015).” (Gardner et al. 2015, p. 1017)

I would like to look in this aspect of the “hope management” greater within this coalition of REBIRTH and MCELS. When read together to amount to general discourse around organoids, this puts the REBIRTH cluster to the conservative wing of the discourse coalition. Organoid, in this way, creates a good buzzword around which the “biotech” discourse coalition can be built. Although the promises of what to achieve might not be entirely certain, scientists are expected to express outward confidence in their predictions of societal benefit (Brown and Michael 2003). This creates the

central element of the promise structures of science. Beyond the level of concept, we can reconstruct a more general understanding of a “practice coalition” taking place not only about the concept but around the general structure, logic, and the culture of promising and recalibrating.

Of course, there are differences between the two projects that I will present with respect to how they position of organoids, yet both are “using” the same vocabulary of biotechnological objects that they are creating. These two projects are MCELS (Multicellular Engineered Living Systems) in the USA and REBIRTH (From REgenerative Biology to Reconstructive THERapy) in Germany. Similar observation is done within sociology of expectations literature; Brown et al. (2003); “Social actors, at individual, institutional or wider cosmopolitan levels construct future expectations which may run in parallel with and contest each other, occupying different timeframes and carrying different interests.” (p. 6). It’s easier to compare since there is the existing understanding of the US is imagined as an “inventor” country, the country itself being grounded within the universality of science and technology (Ezrahi 1990), contrasted with Germany, where biotechnology is as approached conservatively (Brown 2015), the social imaginaries are rather different amongst the two countries. Due to the performative character of the expectations leading the existing research, they are represented as different parts of the discourse coalition. In the chart below, you can see how the imaginaries are different with respect to agents’ expectation ecology. Hilgartner (2015) mentions the making of unimaginable imaginable through the development of biotechnology in his “vanguard visions”. This can conceptually be seen as the first step in the building of regimes of hope analytically, and I will assign the visionary part more directly to MCELS project. Since regimes of hope are forward-looking regimes, I will claim that they can exist within a more general and embracing greater vision of technology, in which the exact object of regime of hope (which is to a certain extent missing the in the literature of sociology of low expectations.)

Making of the high expectations, around the same object

After discussing the case studies as wings of discourse coalitions, I will get back to the vocabulary of “regimes” and will point out that the regimes of truth are not necessarily contradictory within the more general set of practices within development of the biomedical technology that I mentioned before. van Lente (2012) also points out that promising happens at a sea of expectations. I will investigate the elements in this sea.

The expectations literature following Brown et al. (2003) and the European mainly Dutch and British literature mention the possibility of failure of expectations, the vanguard visions have a stronger emphasis on the institutionally holding onto the technological development. On the patient level, this becomes more important. While some expectations are negative (for example, “not to do stem cells research”), the progress into an artifact for the researcher is certain, however for the individual patient this imagined artifact it can mean nothing because the development could be not for her needs. This is uncertainty in the institutional sense, but not sub institutional sense. As Brown and Michael (2003) describe the phenomenon of the trough

of uncertainty as an expectation in biotechnology, they do so through distinguishing between different users of technology as well as different hearers of the discourse around it without going into detail.

In short, my addition to the literature is MCELS/REBIRTH contrasts and through asking the question of the regime of hope, but towards whom? Or put in another way, is the regime of hope that is prevalent in the understandings of the patients related to the techno medical interventions that they are having the same with the visions of researchers that are shared by publics? In this part I will argue that the answer is yes. When the object under investigation is not a concrete product but a group of objects that are bundled together with their functions and structures through a set of different criteria, they are connected through a discourse coalition (Hajer 2009). Concept of organoid are good candidates as objects which exist in such discourse coalitions, and the research discourses of MCELS and REBIRTH make up the coalitions in which discourses occur.

van Lente (2000) argue that technological futures are “forceful” in the sense that, the visions of future due to expectations of technological development from other actors in the field, apply a pressure for firms, public structures and the like to follow the imagined futures. This way, the health technologies developing within REBIRTH are required to use the “ideographs” of the research field that they are relying on. Three forces of expectations in the dynamics of technical change: *legitimation, heuristic guidance and coordination* are laid out in the literature of sociology of expectations (van Lente 2012). Buzzwords are doing the task of coordination amongst scientists, in such large research clusters, coordinating the expectation of the researchers to each other as meaningfully defined technologies with certain functions are also important. The intermediate objects of research, such as “organoids” create these kinds of platform objects to align research to not only employ these technologies but develop further methods to embed them in the common research methodology of biomedical sciences as models or trials as well as making them a more embedded part of the research in general.

In certain contexts, where people are already hospitalized and are undergoing treatment it might be relatively easy for the researchers to use low expectations discourse without much reliance on the discourse of hope since they already are set (Swallow et al. 2020). However, his analysis does not address the choices amongst the competing higher promises, particularly in research and from research to clinic relationships. The main “high hopes” for technoscience as a general premise is still at play within low expectations. Referring to this space Swallow et al. (2020) discuss how management of hope and expectations are taking place in the clinical set up, but they do not mention how the general discourses are out there to be constructed so that patients and different kinds of medical personal as well as researchers can reach to them. A similar example of following the “missing object” in the sense of fulfilling the missing part of the clinical intervention through the care-based perspectives is also argued for by Day et al. (2021)

Similar to the organoid coalition a “negative” of the hopeful expectation in the field is already discussed. In the making of clinical neurosurgery, two prominent experts from the field, Breeze and Wang when looking into the developments of their field, acknowledge common historical origins and epistemic assumptions of research

and clinic, they emphasize the difference between ‘destruction’ and ‘restoration’ of neural tissue, despite the dependence of ‘restoration’ on the introduction of exogenous neural tissue such that ‘alteration’ and ‘restoration’ are in fact conceptually indistinguishable (Breeze and Wang (1999)). They reinforce this through how they see destruction through the experiences of lobectomy, and they position themselves in the very different restorative science. That is the promise of REBIRTH in the very first place as I have explained it in the case study. Yet, through the discourse coalition around organoids it creates are connected to the engineering discourse when needed by MCELS. Tutton (2011) observes that in biomedical research that is already the case that the companies are shifting from one regime to another, the very mechanism of this is argued to be through the patients who follow regimes at clinical settings, but taking part in technoscientific imaginations as a member of the public is also an issue. I think that connecting this to the discourses as a way of making the social aspect of it highlighted is also important. The relationship between different wings of the discourse coalition of “biotech” in this regard is close to that Moreira (2006) calls Mutual Parasitism. As he argues, “is a general form of socio-technical coordination through which different knowledge practices are both harmonized and continuously distinguished.” They are distinguished and are using the line of distinction to relate themselves to different visions and imaginaries.

However, researchers are also carrying out such recalibration within their cultures of research as they necessarily relate themselves to both the research communities and research representations, and towards the clinic, vanguard visions and public imaginations. In short, both aspects of the discourse coalition provide a good space to manoeuvre and enable different expectations to operate through unifying on the “same” object, when the object at hand is not concrete, but has different characters with respect to different visions.

	REBIRTH	MCELS
Expectations of whom	Medical schools in Germany	(Bio) Engineering schools, the USA
Low expectations of whom	Direct clinical application/patients who need applied research	Very broad future looking understanding of patientness due to abstract clinical promises
Visions/imaginaries of whom	Healthcare related “conservative” research structures in Germany	USA based, vanguard engineering visions, visions of tech companies

The ethical challenge of patient consent and of research expectations research question (b)

I have highlighted the importance of higher level, remarkably successful visions of future in the shape of technoscientific visions in the motivation of the development of technologies which is hard to be contained and can be going in the direction of the patient. Moreover, I also claimed that this is already embedded in the structure of the research objects’ surrounding ecology. Now I would like to talk about the direct practical, ethical implications that are required to accompany these perspectives, most importantly, how to put a heavier emphasis on reconsidering technology and recalibration. Jox et al. (2012) points out that informed consent is difficult to

attain due to unrealistic expectations of the patients in certain clinical settings. I have argued above the importance of promises. In such clinical examples, the expectations are following the vanguard visions of the developments of technology as regimes of hope which are the promised solutions to the patient as a member of public. This dual character becomes particularly pressing around the promises for regeneration, organogenesis on the conservative wing, which is directed at the patient as more deployable technologies, yet not calibrated for low expectations. The possibilities on the other hand of these kind of treatments depend on the progressive wing of the coalition to develop technologies around organoids as entities. Based on the performative character for the existence of the objects at hand, the very possibility of consent depends on the representation of the technologies within expectations of biotechnological devices of health.

The question about informing the patient with respect to consent here comes up with a dilemma, here I will extend on that dilemma a bit. For Jox et al. (2012), the main issue is that informed consent is difficult to attain due to unrealistic expectations of the patients. Although I agree with this claim, we need to tackle this issue through acceptance of the necessary element of the public imagination and the collectively held vanguard visions as a necessary and fundamental element within the democratic public in the democratic governance of technology. In the literature of sociology of expectations, it is noted that it is quite difficult to distinguish between the validity of a claim of technoscientific innovation and its collective perception (van Lente 2000; Berkhout 2006). However, an added layer of promises of coalitions are important in making the therapy related technologies understandable and imaginable, in the sense that the claim is not only towards a singular audience, but towards multiple in biotechnology with health-related outcomes, such as the patients, the research agencies, the universities and the private companies.

Without such imaginations of magnificent scale being presented to the patient as a member of public vision, there it becomes difficult to fund and support the possibilities of developing technology for clinic. In a way, clinical research requires a certain kind of optimism and this vanguard visions are making the sea of expectations possible. However, since discourse coalitions are not about single objects, but are connected to technoscientific imaginaries which constitute many different “biotech”, such high expectations are distributed to many different technologies instead of the one that the patient at that moment acutely needs. For the patient to look from the domain of possibilities for herself to be the patient in the very first place there needs to be a certain kind of shared vision of future at the macro level in which the patient or to be patient can apply this to her individual case. That is to say, the patient as a member of the public only experiences the hype and high expectations coming from techno scientific imaginaries, and such imaginaries are not directed towards a concrete or development of a particular technology but rather some kind of representation of the ideal generalized to the public.

The larger consent relate question is, how to be able to provide consent for a process if the expectations that you are acting upon are still different than what you are “informed of”. On one hand, having multiple representations in the sense of micro and macro levels (of low expectations and calibration to them and vanguard visions as enabling technology) where both images are there within the same object seems

like the solution to that, however, until it is achieved as such, a governing politically public representation of science and technology separate from the image of the patients' direct interventive image. Image of rehabilitation is only possible after application becoming a routine to the patient since the established interventive technologies depart from the shared vanguard vision and become more routine technologies in the minds of people. In short, the very possibility of consent controversially makes it difficult to obtain consent. Based upon the existing problems of idealization (Sample 2022) in the sense of taking the idealized understandings of science as given reality that we operate on, I join Sample in his critique, with the addition of embracing the idealizations to give the parts of scientific making of meaning less harmful frameworks.

Programme/representations	REBIRTH	MCELS
Visions	Stable	Vanguard
Imaginarities	Regenerative/maintaining the life—non life boundary	Generative/undermining life—non life boundary
High expectations/low expectations	Provided by MCELS related visions and imaginaries of engineering	Nothing is expected as a direct outcome, lack of low expectations

Conclusion

Although the starting point of sociology of expectations was to a certain extent, developing a good relationship between the public and the technology of development, it was criticised not having space for low expectations. So far, much of the sociology of expectations has been pursued without engaging the literature and perspectives of vanguards visions and social imaginaries, however entities such as large biotechnology projects could only be understood with a combination of frameworks of sociology of expectations and low expectations and vanguard visions and imaginaries since the exhibit different planes with respect to promises and visions towards different publics and subjects. Moreover, these planes are better actualized within the larger working framework of health-related large projects of biotechnology. Since sociology of low expectations overlooked the larger framework of technological imaginaries in the making of the consent related discussions, this interrelation is provided through looking into the case studies where two different imaginaries are taking place around organoids.

From the analysis I have provided so far, keeping the general visions and imaginations of the public when analysing a more clinically oriented analysis in the form of sociology of low expectations in mind is a good addition to the existing literature. This method does not fall back into the problems that are mentioned in the making of sociology of low expectations (Gardner et al. 2015) as a departing approach from sociology of expectations literature of Brown and Michael (2003). The structure of biotechnological objects in the making can be analysed within a manifold of representations of the object and the technologies existing in different forms. How these objects are selectively presented and represented through different discourses, and how do they can coexist through various parts of discourse coalitions becomes an

important aspect of the research starting from conception to the ethical consequences of the technologies.

I responded to the sociology of expectations literature and arguing that integration of the imaginaries literature is important into their work for research question a. Furthermore, for research question b, I argued for this integrated framework for calibration between low expectations and imaginaries with two novel case studies, reporting some normative concerns with respect to consent by asking the actor related question to expectations framework.

My analysis calls for a more interrelated history of the objects and technologies that are placed within sociology of expectations, such as in conceptualizing, using in research and of various levels of existence of such research objects. This multi-layer understanding that I tried to provide will not only help carving the point that I mentioned in ethics, but also will be of help for other accounts of analysis at the international scale in the making of visions within discourses.

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