Will pigs be able to fly one day? [...] Anyone who will try to make pigs fly [...] will have to get our consent. (Zurr and Catts, ‘Big Pigs’)

When the Two10 gallery in London (an art venue operated by independent British charity Wellcome Trust, an organization mostly interested in biomedical research) commissioned art for the ‘Working Drafts’ exhibition in 2000 that was supposed to address the cultural impact of genetics (inspired by the announcement of the first working draft of the Human Genome Project), they were thrilled when seven artists submitted their ‘subtle’ and ‘harmonic’ pieces, whose ‘overall effect is benignly futuristic’ (Jones). This future envisioned by the exhibit, as curator Denna Jones argues, is supposedly vibrant with utopian potential: ‘I think this is in keeping with future applications for the genome: its potential is vast and for each of us there may be one “interpretation” that holds significance for our future.’

What the official curatorial statement does not mention is that critical proposals, such as that offered by the Tissue Culture & Art Project (TC&A), initiated by Oron Catts and Ionat Zurr, were rejected in a vetting process because, as the artists later announced, ‘the advisory group felt that our project presented an unrealistic reflection of the public’s opinion of the Genome’ (Zurr and Catts, ‘Big Pigs’). Their proposal for Wings detached, the tissue-cultural generation of three sets of wings from pigs’ stem cells, is offered as ‘an exercise in putting things in perspective,’ claiming that the original impossibility of the claim ‘pigs might fly,’ leading to its cultural use as connoting unrealistic fantasy, is today made possible via genetics and the art object would be a way to ‘gauge how people will react to the fulfilment of other fantastic claims’ (Zurr and Catts, ‘Big Pigs’), that is, those made by genomics. By satirizing
the wish-fulfillment strategies of biotechnology (in creating miniature wings) and adding to their proposal the claim to file a patent on the wings in order ‘to “initiate and control” the pig wings “market”’ (Zurr and Catts, ‘Big Pigs’) (leading to the above-quoted pronouncement of intellectual copyright), the artists demonstrate the subversive potential of art to interrogate corporate strategies in shaping the technoscientific discourse on biology.

Zurr and Catts are very outspoken about a phenomenon they refer to as ‘Genohype, [...] the discourse of exaggerated claims and overstatements concerning DNA and the Human Genome Project’ (‘Big Pigs’) and which they find to be essential to general discourse on biology. In this, they point out a tendency already diagnosed by Dorothy Nelkin and Susan Lindee in 1995 in their discussion of ‘the DNA mystique’ – that the gene has become a cultural icon, that DNA has become ‘a powerful, magical, and even sacred entity’ (3) evoked in public popular discourse. In their preface to the second edition of the book in 2004, Nelkin and Lindee suggest the discursive tendencies of the 1990s have solidified in ever-present realities – DNA has become a powerful tool with immense potential in public discourse, from politics to economics, from academia to art: ‘DNA is political territory, and mapping the genome was both a scientific and an economic breakthrough’ (xii). It is here that the misrepresentation of genetics is forcefully created to coincide with economic interests of biotech firms and a neoliberal and transhumanist eutopian agenda.

Most importantly, Zurr and Catts argue, all biological research gets conflated with genetics just as much as all bio-art gets conflated with genetic or transgenic art. As Zurr and Catts repeatedly point out, their work is based in tissue culture and not genetics, and the ‘engagement with life’ can take place on other levels than the genetic: ‘the cellular, the tissue, or the organ level’ (‘Ethics’ 128). The conflation of all biological research as genetics oversimplifies the reality of work in biotechnology by reducing it to the culturally known iconic marker, but also streamlines the highly complex and hermetic work for possible investors, ‘following a path of least resistance by applying established narratives’ (‘Ethics’ 126) of DNA as code, and biotech as fundamentally the same as cybertech. For biotech to succeed economically, PR advisory firm Burston-Marsteller warned, ‘rational debate’ and scientific facts would not bring the desired result; instead ‘bioindustries should proliferate “symbols eliciting hope, satisfaction, caring and self-esteem”’ (Stevens 53). In staging shows (such as the ‘Working Drafts’ exhibition) and commissioning art, biotech companies and their lobbyists began ‘to create the visual and discursive languages they desire’ (Stevens 53) and
to disseminate them through media outlets and into popular culture and discourse, thus shaping public opinion.

Genohype does not just convey the message that all biology is genetics, but further simplifies and reduces the complex scientific discoveries involved into catch-phrases that can be exploited by liquid modern, neoliberal realities: “We are our DNA” is one of these simplistic and misleading rhetorical statements’ (Zurr and Catts, ‘Ethics’ 126), as is the assertion that DNA is a code, which can be used to ‘unlock’ the mysteries of life. In this rhetoric, one can identify the HGP’s original utopian metaphysical promise ‘to reveal the genetic blueprint that tells us who we are’ (Fox Keller 4), but it also hints at more concrete transhumanist promises such as those made by the American Museum of Natural History, when they announced their ‘Genomic Revolution’ exhibit: ‘By the year 2020 it is highly possible that the average human life span will be increased by 50 percent; gene therapy will make most common surgery of today obsolete; and we will be able to genetically enhance our capacity for memory’ (cited in Stevens 45). In remaining with the simplistic equation of DNA as code, curing a disease should be as simple as finding the defective line of code and replacing or deleting it. At heart, genohype allows for the ultimate utopian promise – that with technological progress (in genetic engineering) that last chaotic aspect of biological life can be conquered: ‘After all, we are still granted a certain sense of control when dealing with a body that is neatly and logically codified according to its DNA pair bases, rather than when we are confronted by the messy and irrationally behaving visceral body’ (Zurr and Catts, ‘Big Pigs’).

Reality, as opposed to this rhetorical strategy, is not as neat and optimistic. Gene therapy, the cash cow of neoliberal biotech companies, has so far produced only failures and not a single success: ‘while there are several hundred ongoing experiments, not a single one has proven that human gene therapy can offer permanent relief without side effects’ (Stevens 47). And where originally the HGP was supposed to provide a ‘Rosetta Stone’ to unlock the vast genetic potential, molecular geneticist William Gelbart now speaks of his profession as being ‘functional illiterates’ (cited in Fox Keller 6), resulting in the need to change tactics in genetic research: The new phase now necessary is ‘functional genomics rather than structural genomics’ (Fox Keller 7) in order to determine the intricacies of how genetic information expresses a certain biological meaning. Evelyn Fox Keller argues, ‘Contrary to all expectations, instead of lending support to the familiar notions of genetic determinism that have acquired so powerful grip [sic] on the popular imagination, these successes [of the HGP] pose critical challenges to such notions’ (5).
The notion that original claims for the HGP (and much of the rhetoric driving genohype) are fantasies of transhumanist and neoliberal making is thus made the butt of the joke proposed by TC&A’s *Wings Detached*. The wings themselves are characterized as ‘the good, the bad, and the extinct,’ referencing the evaluation of genetic traits and the inherent possibility of ‘genetic-based eugenics’ (Zurr and Catts, ‘Big Pigs’). By shaping the wings in reference to bird, bat, and lizard (pterosaur), the artists reference the mythological values attached to specific genotypes and the risk involved in such evaluation: The wings become strong symbols for angelic goodness/purity, demonic badness/impurity, and scientific/evolutionary extinction. Interestingly, Zurr and Catts also point out how the human fared in terms of this mythologizing of biology and the artificial creation of wings: ‘But it might help us to remember that the implicit humane/angelic continuum also carries the curse of the mythic Icarus, who burnt his wings trying to fly too close to the sun’ (‘Big Pigs’). The utopian promise of Daedalus’s invention turned dystopian and cost the ‘over-achieving’ son his life – this critique is just as much part of the metaphorical dimension of this art project as is the proverbial flying pig. In the end, with the miniscule dimensions (4cm by 2cm) and the inappropriate presentation of the wings (in jewelry boxes), it becomes depressingly clear to viewers that the ‘Pig Wings embody the promise and the disappointment, which underlies the rhetoric and hype of scientific discoveries and implications’ (‘Big Pigs’).

In terms of its sociological position, genohype can be placed firmly within the strategies of liquid modernity as described by Bauman. By claiming that each individual is locked into the code of DNA, responsibility (in the sense of changing one’s DNA) is also found only in the individual. The hunter’s utopia thus is the search for options to eliminate weaknesses in one’s own DNA and to improve one’s fitness. Neoliberal conceptions of DNA as patented source material for solutions to life choices and the marketing of ‘cures’ for flaws in the individual genome all fall squarely within both conceptions of liquid modern realities and genohype conceptions of technoscience. Life, in its genetic essentialist form of DNA, becomes a marketable commodity. In addition, all of this strongly co-relates with the views presented not by critical posthumanism but by transhumanism. Evolving humanity by eliminating the bugs in its code, transcending biological determinism by altering the building blocks – all of this is part of the transhumanist agenda and one possible option to improve upon the currently flawed material embodiment of the human.

The cultural artifacts of biopunk presented in this study thus all prove to be interventions into and critiques of this form of genohype
(though not always equally successful). Leaving aside the fact that ‘any attempt to critique the power of genomics in fact reiterates its power through those gestures of deconstruction’ (O’Riordan 73), these artifacts oppose genohype by self-consciously navigating perspectives informed by critical posthumanism, a critique of liquid modern realities, and an awareness of the science-fictional dimensions of possibility and consequence. They are cultural discursive interventions that provoke and educate viewers/readers/players by presenting dystopian visions of the posthuman and relating them back to contemporary social and political realities – signaling both a warning about the future and a call to recognize possible actions.

In a way, biopunk artists such as those presented here may already have experimented with and aligned their work to an alternative conception of the life sciences that Zurr and Catts propose as the critical solution to genohype and the transhumanist notion of genetic determinism and reductionism. Their proposal is to shift the paradigmatic metaphor in thinking about life from DNA to cell, from data and informational technology to community and sociology. The organization of life is thus dependent on three interdependent factors, ‘genes, organism, and the environment’ (Zurr and Catts, ‘Ethics’ 136):

> these relationships [organism and its environment] are not simply a matter of information processing, but of informatic-based understandings of biological life that is inseparable from the material, meaning-making process of the organism: Biology must therefore first consider the living as a meaningful being. ... To live is to spread out; it is to organize a milieu starting from a central reference point that cannot itself be referred to without losing its original meaning. (Canguilhem, cited in Zurr and Catts, ‘Ethics’ 136, bracketed material in the original)

Information held by the gene might express itself differently in different organisms and be massively influenced by the environment. In using the cell as the basis of biological life, community and interrelation are stressed, while retaining individually operating units: ‘[C]ell theory allows autonomy to parts which can operate, evolve, and mutate independently and in direct relation to their surrounding’ (Zurr and Catts, ‘Ethics’ 138). This, of course, is strongly reminiscent of the critical posthumanist position of a zoe-centric, hybrid, and interrelated subjectivity as proposed by Braidotti.

This leads us back to Bauman’s sociology and his twofold interrogation of liquid modernity that has been discussed throughout the previous
chapters. Bauman’s work can be grouped under two different aspects: (1) analyzing the ‘meta-level’ (Tester 162) of globalization, its functions, and social consequences, the relations that cells find with and to each other, the global environmental influences. And (2) analyzing the ‘life-political level’ (Tester 162), the individual life choices, the personal consequences, the cells themselves, the autonomous parts, and their operations.

Literary biopunk, as exemplified by Paolo Bacigalupi and Margaret Atwood, allows for the most far-reaching extrapolations of the social consequences of genetic engineering; furthermore, it provides the broadest and most ‘meta’ level of abstraction. It is thus little wonder that both depicted literary worlds open up questions of future hybridized societies. Importantly, both portray the creation of posthuman, genetically engineered entities and in it reveal the chaosmic force of zoe, the messiness of biology claimed by Zurr and Catts. The environmental influences on and the embodied reality of the genetic information prove too strong an interference for transhumanist or neoliberal utopias to come into existence. The genetically coded creatures (both human and non-human animals) prove too adaptable for commodification and in the end run amok, disclosing the precariousness of alleged biological categories and the fallibility of humanist notions of exceptionalism.

Instead these literary extrapolations of the liquid modern consumption of life debunk the myth of human superiority and the genetic determinism of genohype by flaunting epigenetic and environmental factors in the development of organisms. The focus on the social and communal aspects of the consequences of technoscientific developments finds its outlet in the long and thoughtful story arcs of science fiction literature. Both Atwood and Bacigalupi use this medium to provide an outlook onto future generations and the changes brought about by the technoscientific progress of genetics in liquid modernity. By explicating the needs and concerns of a consumer society that led to the creation of genetically engineered beings, the commodification of life, and the global capitalist drives towards new marketable products, both authors focus their attention first on the science-fictional dimension of possibility that current genohype trends open up and thus reveal more the reflection of a dystopian present than a dystopian future. In a second step, though, both authors explore these trends further and engage in an extrapolation of a future posthuman society, shifting their focus onto the science-fictional dimension of consequence. Here, both seem confident that a paradigmatic change will lead towards a eutopian moment, in which a critical posthuman subjectivity has become a possibility. Whereas Bacigalupi is more pessimistic about whether the human will survive, instead projecting a conflict between two competing species and simply
conjuring up the image of a posthuman entity that is better equipped for the changed realities of this new future, Atwood remains hopeful that human and non-human will merge into a hybrid, interconnected, and protean form of society, embracing the other perspective and adding to our understanding of ‘what counts as the basic frame of reference for the human’ (Braidotti 40).

Similarly, the biopunk zombie films discussed in chapter 7 offer a globalized view of liquid modernity by extrapolating contemporary trends of exterritoriality, of capitalist sovereignty in the form of Empire and the ensuing global conflicts of terrorism. Here, the focus of the writers involved (Paul W.S. Anderson for the Resident Evil series and Danny Boyle and Alex Garland for the 28 Days franchise) is clearly on the science-fictional dimension of consequence, extrapolating the genetic engineering of zoe (in the form of viruses and bacteria) for posthuman thanato-technological warfare. In allegorizing the global spread of exterritorial Empire and terrorism as a genetically engineered zombie plague, the massive ramifications of social inequality and the precariousness of human lives is enacted as a literal fight for survival against the necropolitical machinations of the capitalist system. All those falling prey to necropolitical control become wasted lives in Bauman’s sense as redundant parts of society – in the visual metaphor of the films, they die and return without social productivity as zombies.

In terms of the genohype, the genetic code of the manufactured plague is shown to be highly mutable and adaptive, thus rejecting any fantasies of necropolitical control over the patented DNA and the selective manipulation of genetic traits for profit. Instead, zombies function similar to cancer in cell theory: No matter what the original purpose or make-up of the cell, once the mutation sets in, the cell is converted and taken over. Ironically, the view of a future human demise as dystopian is subverted in the films by the critical posthumanist reading of zombie subjectivity. From a zoe-centric viewpoint, human society and its influence in the form of the Anthropocene has proven far more destructive to life on earth than the zombies will be. In effect, the cancer is not just better equipped to live but also less disruptive to other life. The zombie consequently represents (from a human perspective) an incomprehensible utopian moment that imagines a time after the Anthropocene, a future without the human in it. The open-ended structure of the zombie film narrative, its ‘anticatharsis’ (91) of not allowing the human survivors to reclaim normalcy, as Lauro and Embry argued, further enhances this posthumanist reading in that no enclave, no human habitat is ever safe from the threat of zombification. The cancer might be remittent but can never be cured. In its serial
structure, the zombie film franchise and its allegorization of globalization forces are thus ideally geared to represent the continuous need for vigilance and outspoken warning that Bauman sees as the purpose of sociology (see Liquid Modernity 216).

At the other end of the spectrum of Bauman’s thoughts on liquid modernity is its growing influence over the private sphere and the reforming of systemic risks and communal responsibilities as issues to be dealt with by the individual via their life choices. This ‘life-political level’ of liquid modernity, for example, strongly influences current notions of family and parenthood, according to Bauman, in that these are similarly subject to commodification and no longer provide the institutional stability they might have presented before. Independent filmmaker Vincenzo Natali is thus able to focus on the personal life choices of procreation in his film *Splice* by using the genohype notion of programmable life, DNA as coded information that can be copied and pasted to create a hybrid entity with specific traits selected by reading the blueprint. In concentrating on the science-fictional dimension of consequence (what it means to create life), rather than the dimension of possibility (how that life is created genetically), the film strongly emphasizes liquid modern anxieties about commitment and fixity. The film thus intimately negotiates the consequences of the commodification of life, using the posthuman genetically created splice to showcase the unpredictability and monstrousness of *zoe*. Further, *Splice* engages in a lively debate about genetic determinism by calling into question perceived notions of identifying specific genetic traits and revealing instead the interconnection of gene, organism, and environment.

Visually, the film favors a highly personal narrative viewpoint (focused on the life choices of the two scientists) that relates the individual consequences of liquid modernity to the viewer, rather than foregrounding the larger social groups of survivors depicted in the zombie films. Further, the concentration on interpersonal relations and psychological anxieties instead of the mainstream depiction of action places *Splice* in a different register of filmic language altogether. The film portraits its posthuman entity not as gory and horrific creature (the zombie) but rather as mysterious alien life form, shocking and fascinating at once, monstrous in its categorical uncertainty between human and non-human. The dystopian imagination of the film is not a vision of humanity being replaced by the posthuman, but a struggle with the monstrous as already present in and part of the human.

In *Splice*, the other becomes a monstrous reflector of human identity construction through the interplay of both nature (DNA) and nurture (environment), highlighting the uncertainty in this distinction. In
contrast, the video game *BioShock* fully engages in speculations of genohype and the deterministic notion of readable and adaptable DNA – allowing for genetic manipulation of the self. The game focuses on personal life choices in hypercapitalist consumer society, but rather than stressing the potential of the posthuman other to be exploited (as *Splice* or the biopunk zombie films did), *BioShock* concentrates on the transhumanist notion of individual transcendence and self-advancement. In the world of Rapture, the individual is faced with the need to constantly adapt to new environmental challenges, forcing a continuous motion of becoming-posthuman in the transhumanist sense of being able to buy the commodity of a new and personalized set of DNA. But the game subverts this utopian ideal of exchangeable genetic identities by revealing the mutability and uncontrollability of the new DNA, leading to the destruction of the human base DNA and the loss of all distinguishing marks – in effect turning utopia into dystopia and conflating all posthumans into a faceless mass of enemies driven by their desire to further consume identities and regain individuality.

Moreover, the game flaunts the desire to consume and conform to the social mores of a hypercapitalist society in that it integrates the player into complicity with the moral values conveyed in the game via metalepsis. As a medium that foregrounds interactivity and the agency of the player in choosing the path of the game, the mechanics of *BioShock* highlight the illusionary nature of any player autonomy and the *de facto* exclusion of the interactor from the authorship of the game. As an allegory for consumer society, this mechanic thus reveals the fallacy of a belief in the individual as determined by DNA and thus empowered by technoscience and the commodification of life. There is no freedom of choice to act to their own benefit, but only the systemic need to continuously counteract the insecurities and indeterminacies of liquid modernity.

As I have thus shown, Bauman’s compass for liquid modernity is present on both the globalized meta-level and the life-political level of individual life choices. Biopunk cultural artifacts explicitly foreground the science-fictional dimensions of liquid modernity by using concepts of genetic engineering and biotechnology. Bauman’s sociological thought thus reverberates in these biopunk dystopias, emphasizing the need for education in contemporary times, sounding a warning call that globalized risks and individual life choices are two sides of the same liquefaction of social mores and values. But as my discussion of the TV series *Heroes* has shown, the two interrogations of liquid modernity are able to meet. Posthumanity here functions as a catalyst that allows us, humanity, to evolve and eradicate globalized risks – not via the
dissolving institutions and social structures of solid modernity but in newly founded communities of individuals. And whereas the newly established community of posthumanity might resemble Zurr and Catts’s cell theory of autonomous parts that interact and grow with and through their environment, at the heart of this series is the deeply genetically deterministic and genohype-inspired notion of the potential for heroism springing from the genetic ability to evolve into posthumanity.

As I have said, not all examples of biopunk are equally successful at resisting genohype and the transhumanist notion of human individualistic transcendence, and *Heroes* is definitely fraught with problems in that regard. Nonetheless, it still submits the idea of communal, cooperative, and interrelated subjectivity as a basis for addressing the social and political problems of liquid modernity as central. In this, the examined cultural artifacts of biopunk science fiction are united. All of them posit a utopian potential for a different future by revealing a critical posthumanist notion of subjectivity as key. This potential might not include us, or include only a radically altered version of us, but it is existent. In extrapolating the dystopian present of liquid modernity and disclosing the diminishing dimension of science-fictionality in terms of the possibilities of technoscience, especially genetic engineering, biopunk dystopias function thus as education and warning. They are a cultural intervention into the sociological dimension, in that they are ‘aimed at disclosing the possibility of living together differently’ (Bauman, *Liquid Modernity* 215). And this possibility includes not just the human, but also the inhuman, non-human, and posthuman, in all their *zoe*-centric, hybrid, and interconnected subjectivity.