

Rod Dillon & Jen Southern

Para-Site-Seeing

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Commissioned by NEoN (North East of North)

and

the Wellcome Centre for Anti-Infectives Research

2018-2020



Foreword

When art and science collaborate successfully the outputs stimulate, delight, entertain, inform and challenge. Para-Site-Seeing is a superb example of such a successful collaboration, bringing all of the above to a wide and large audience. During the exhibition I was able to engage with people aged from 6 to 90 years old, from science and the arts and from all walks of life. The beautifully created and beautifully curated pieces were playfully and very effectively choreographed for the visitor, taking them on a journey through the exhibits, with an all-important passport to stamp along the away. The exhibition explored the complex relationship between the deadly Leishmania parasites and the sand flies that transmit them, the people who suffer from them and the scientists and doctors who research them - done very creatively from the parasite's perspective. We are very proud to have been able to host Para-Site-Seeing in the interdisciplinary LifeSpace Science Art Research Gallery which, appropriately for this exhibition, is immediately adjacent to the Wellcome Centre for Anti-Infectives Research. Although one of the sworn aims of the Centre is to 'do the parasite in', I think we all now understand our enemy (or is it our friend?) a bit better thanks to Para-Site-Seeing.

Sir Michael Ferguson CBE, FRS, FRSE, MedSci Regius Professor of Life Sciences, University of Dundee.



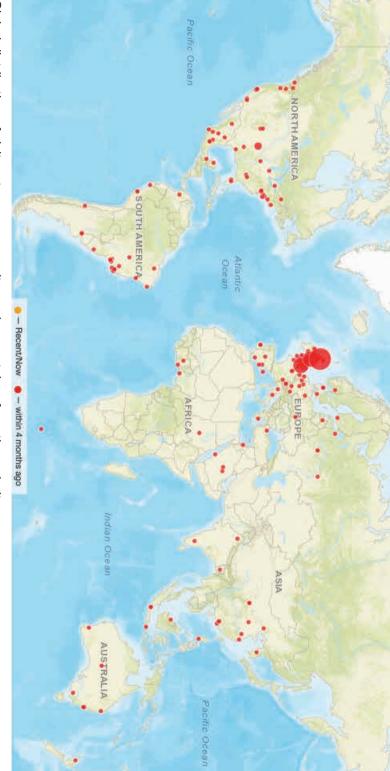
Introduction

Para-Site-Seeing is an art-science collaboration exploring the mobilities of the *Leishmania* parasite. It began as an online digital project, conceived as a way to think about the perspectives of non-human life. In this case a single celled organism called *Leishmania*, the cause of a medically important set of diseases named leishmaniasis.

In Lancaster University where we are both based, and at the Wellcome Centre for Anti-Infectives Research in Dundee, we worked with scientists, writers, artists, curators, students and imaging experts to try to imagine the world from the perspective of a microscopic parasite. Many of the images, texts and even the title were developed through this collaborative process. This research became eight different stories told through social media and a website. The website content evolved to be part of a physical exhibition titled *Para-Site-Seeing: Departure Lounge.* The eight stories were situated at different parts of the departure lounge, and visitors were invited to 'become' the *Leishmania* parasite and travel through the installation collecting passport stamps.

This publication explores the work through texts written by the artists, curators and commissioners, and we hope will act as a lasting record of its many facets. We would like to thank everyone who has contributed to, and helped to realise, this project.

Rod Dillon & Jen Southern, 2019.



Global distribution of visitors to www.para-site-seeing.org taken from the website.

Para-Site-Seeing

Donna Holford-Lovell (Director, NEoN Digital Arts)

NEoN Digital Arts (NEoN) and the Wellcome Centre for Anti-Infectives Research (WCAIR) were the co-commissioners of *Para-Site-Seeing*, selected from submissions to an open call. During 2018 NEoN explored the theme 'LIFESPANS' envisioning the paths of so-called 'digital natives', those born into an Internet and digitally-enabled world. NEoN festival was programmed to bring together works of art that reimagine what it means to be human in the digital age, and the criteria for the work in this case was that it should be manifest primarily online and accessed by the public via the web.

The co-commission with WCAIR was an exciting opportunity to highlight the work of artists who challenge and celebrate ideas of time, transmission, generation, and the here and now. Creating a web-based artwork that tackled the complexities posed by the theme LIFESPANS along with serious drug development work of WCAIR was very cunningly interpreted by the project *Para-Site-Seeing* from artist/scientist Rod Dillon and artist Jen Southern. This work engaged the landscape of the web as it is, and manifested itself in a takeover of currently popular social media platforms –Twitter, Instagram and YouTube.

The takeover is appropriate here too, as parasites themselves hijack, cannibalise and parasitically inhabit other habitats. Playing with the metaphor of sight-seeing and through the eyes of a parasite, *Leishmania*, Dillon and Southern exposed its deadly real life effects alongside the frivolous way in which ones lifespan is publicly documented and exposed via our online footprint. Audiences were invited to follow the travel blogs of the parasites to better understand how they transform themselves to live in different hosts



 both animal and human. A vlogging, blogging, addicted tweeting Instagrammer parasite! The 21st-Century Influencer, re-infecting the global population from the inside of a sand fly's gut.

As with all 'infections' there are often strong immune systems to fight incursions off, and online this is the case too. There is such demand for our attention when we are surfing the web, it's any wonder if an eccentric narrative about a deadly parasite makes much of a mark. But for NEoN what matters is that a work of art like this might very well introduce audiences to an aspect of research they hadn't even heard of before, and certainly didn't know was happening in Dundee.

Para-Site-Seeing: Departure Lounge Public Engagement

Holly Yeoman (LifeSpace Curator and Project Manager)

Para-Site-Seeing: Departure Lounge is the progression of Rod Dillon and Jen Southern's travel blogging portal for the deadly *Leishmania* parasite. *Para-Site-Seeing,* the original web-based artwork, playfully utilises social online sharing platforms to creatively communicate the perspective of the *Leishmania* parasite. The work provoked the viewer to consider the history and impact of an overlooked parasite, and the non-human perspective in a multispecies world.

When striking up a dialogue with Rod and Jen about the evolution of *Para-Site-Seeing* in LifeSpace, it was hard to not let our minds run wild. Before we knew it, we had conceived a take-over of



the gallery — *Para-Site-Seeing: Departure Lounge* was born. The exhibition, equipped with its very own *Para-Site-Seeing* check-in desk and airline stewards, sets the scene for the public to navigate. It invites them to consider the complexities and connections between: the life-cycle of the parasite; its transmission; how this disease affects some of the poorest people on earth; epidemiology and the Wellcome Centre for Anti-Infectives Research (WCAIR) labs' mission — setting its sight on infectious disease and developing cures for Neglected Tropical Diseases.

This was achieved by creating an inviting, imaginative, interactive, fun and engaging space, for visitors of all ages to experience the exhibition at their own pace. This included School of Life Sciences staff, and scientists involved in the making of *Para-Site-Seeing*, who continually populated the exhibition which purposefully was designed as a social-space, holding meetings and enjoying their coffee and lunch breaks together, amongst the installation, surrounded by exotic plants and the sounds of the humorous *Para-Site-Seeing* departure announcements.





Visitors checked in, their Para-Site-Seeing NEoN-green passport stamped, assigning them their parasite identity, guiding them to each zone of the exhibition. They roved the gallery, from *Elektra* Dominica explaining the prehistoric life of the sand fly, the insect vector or host of the parasite, to LdBOB – a Leishmania parasite with a Twitter presence, highlighting the internationalism of scientific research on this parasite and strains of its disease. The Twitter wall and message board urged visitors to tweet and leave written messages for LdBOB and responses to their experience of the Departure Lounge. Visitors ventured their way to the Departure Lounge waiting area, picking up their complimentary UnLeished newspaper, giving an illustrated historic account of the parasite, whilst films gave a parasite's view inside the research labs in the building and Rod's sand fly research through his microscope in Lancaster. This led visitors into Leishmania.we, the sand fly gut or Para-Site-Seeing airline cabin, where the parasite multiplies, which then can be transmitted to humans and some animals through the sand fly bite. Visitors were welcomed to get comfy as they

experienced films giving a family snapshot of the *Leishmania* in the wild as they travel from the blood stream of a human into the body of a sand fly. On leaving the gut-airline-cabin, visitors were met by Ghost_Horde, the persona of the drug, fighting to cure leishmanisis in humans. This assassin-style story reads like an airport novel, as Ghost_Horde tracks down its targets, signalling the crucial work the Wellcome Centre for Anti-Infectives Research are doing developing new drugs.

Para-Site-Seeing: Departure Lounge successfully utilises and subverts the connectiveness of the digital-age and the travel we are accustomed to, to bring into view the Neglected Tropical Disease leishmaniasis, by illuminating the journey of the *Leishmania* parasite. In doing so, it highlights the importance of the work *W*CAIR and other scientists across the world are doing in order to diminish and prevent the disease, reducing global health care inequalities.

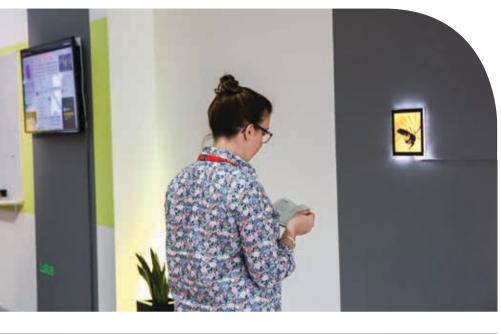




Cabin plan of the gut of a sand fly showing attached/sitting and freestanding *Leishmania*.



Departure board modelled on sand fly flights carrying *Leishmania* between animals and humans in different countries. Flight numbers are codes for sand fly species; LL *Lutzomyia longipalpis*, PA *Phlebotomus argentipes*, PP *Phlebotomus papatasi*.





Elektra_Dominica: Amber is fossilised tree resin that is millions of years old, dating from the time of the dinosaurs. Insects such as sand flies were sometimes caught in the resin and preserved. The latin name for amber is Electrum, and the Dominican Republic is one of the places where sand flies have been found in amber, with *Leishmania* in their mouthparts.



What would you say to *LdBOB*? A *Leishmania* parasite on twitter @LdBOB72

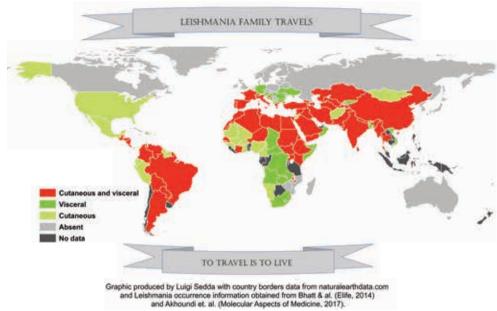
	14808 014-1-22 Nov 2 2018	1
0	LdBOB @ldbob72 - Nov 3, 2018 Hiyyaaaa people! We are LdBOB. Pretty snazzy name right!? Wanna kno who came up with that name and how we got to our current home? Well this is your chance to hear our unique story. Hold tight let this adventur begint	8
	LdBOB @idbob72 - Nov 4, 2018	×
0	Where are we living now? WelillIthat's one complicated story, you se think we are clones. So there is no "me" it's #allaboutus	10
	LdBOB @ldbob72 - Nov 6, 2018	Si
0	Basically we split ourselves in 2 from head to toe. We do fission, not #nuclearfission. We call it 'binary fission' #asexual #agender	
2	LdBOB @ldbob72 - Nov 7, 2018	÷
D	We have family all over the world Twe live in bodies, outta bodies and traveland #YesWeCan fly	1
Ø	LdBOB @ldbob72 - Nov 7, 2018	ŝ,
	Our main family in Scotland is based in @WCAIRDundee where WE are the lab guinea pigs! They feed us, keep us warm and thennnnn test the drugs on us! #shockhorror #whyowhy #whathavewedonewrong	Ū.
5	LdBOB @ldbob72 · Nov 7, 2018	ŝ
	You know what, we're gonna find our roots! Lemme start our search online now, will catch up when we find something juicy #diggingupdeeproots	
I	LdBOB @ldbob72 - Nov 8, 2018	à
	Guess what we found. We have fam in Edinburgh and Glasgow! Funny thing is we are named after a Scottish guy who grew up in Glasgow way back in the 1900's, young Bill Leishman. Wish we'd been named after someone with a bit more Scottish, could have been a Macdonald Q	,
Ø	LdBOB @idbob72 - Nov 8, 2018	3
	So we know where the L comes from in LdBOB, what about the d? Apparently some Irish dude, Charlie Donovan living in Kolkata working f the British Army	or
Ø	LdBOB @ldbob72 - Nov 9, 2018	
	So Ld came from Glasgow Bill and Irish Charlie. But who was BOB? Dee BOB stand for something else? @Bobthebuilder ? Do we build? No way	\$
Z	LdBOB @ldbob72 - Nov 9, 2018	i,
	Nah no building, we destroy [muscle emoji]#maximumcarnage #infect #kill #greviousbodilyharm; we grow in children, babies, puppy dogs and small cute rodents like hamsters #yeswecan	
-		- 244
0	LdBOB @Idbeb72 · Nov 9, 2018 Guess whattitt! OMG found out who BOB is! It was Bob Olafson British Colombia, Canada. But apparently Bob O got us from Dennis Dwyer, so we don't quite know why we weren't called LdDENNIS, but that's scientists for you O	

LdBOB: Non-binary LdBOB in search of their ancestors. LdBOB finds out that their Latin name is *Leishmania donovani*, and was named after Bob Olafson, one of the researchers who used this strain. Scientists from around the world have been talking to LdBOB on Twitter, and so can you @LdBOB72

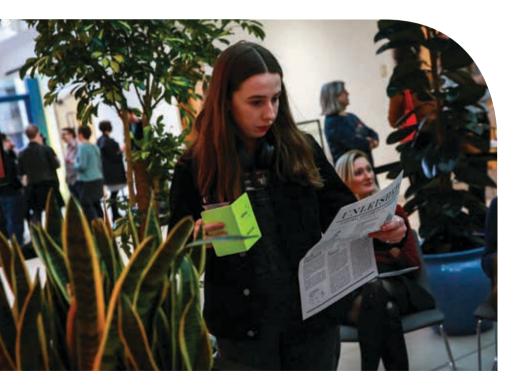




Stamping a passport at different locations around the departure lounge.



Map of the global location of the two major types of human leishmaniasis, displayed above the *LdBOB* message wall.



Unleished: Inspired by D.C. Thomson's 'two intrepid ladies', both journalists from Dundee, this newspaper charts the history of *Leishmania* travel around the world, including its spread with colonial invasion and travel. Available as a blog initially, and then as a newspaper in the departure lounge.







Images from the *Sand_Flyer* Instagram account during NEoN Digital Arts festival and the *Sand_Flyer* video in the departure lounge. *Leishmania* media preparation and sand fly feeding in the Lancaster lab.



Sand_Flyer: This parasite's eye view is of Dr Rod Dillon's sand fly research at Lancaster University. Get up close and personal as you look back at them inspecting you down the microscope.



Freezr_Cat3: Get a parasite's eye view inside the highly secure category 3 research lab in Dundee. Join parasites emerging from the storage cryo-freezer to take a ride on and through a series of experimental equipment!

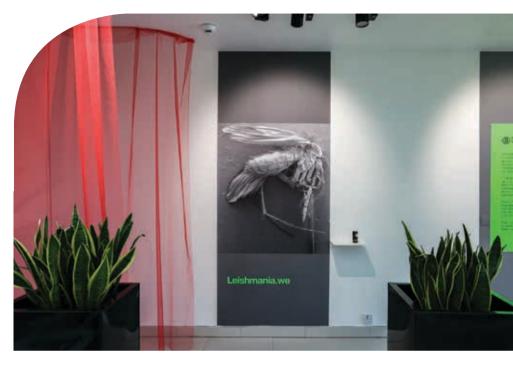








Stills from *Freezr_Cat3*. *Leishmania* cryopreserved for many years in protective chemicals at -80°C and then revived in a few hours.



Scanning Electron Microscope image, made in Dundee, of the female Brazilian sand fly *Lutzomyia longipalpis*.





Leishmania.we: Leishmania multiply by dividing in two to produce clones of the original parasite. This story started on Instagram as a series of family snapshots of *Leishmania* in the wild, as they travel from the blood stream of a human into the body of a sand fly. The content was then formatted as an inflight movie for *Para-Site-Seeing: Departure Lounge.*



The blood-red sand fly gut where *Leishmania* cut-outs can be detached and reattached to the ceiling, mimicking the way that parasites attach to the gut wall allowing them to travel back into the blood of the next mammal to be bitten.

@GhostHorde

Getting in is the easy part. I slide down the oesophagus, keeping myself together until I reach the stomach. That's when I spread out, changing from a single pill into an army of assassins.

I am multiple. Am I a ghost horde as I pass through the gastrointestinal tract? A permeating harbinger? The acids and bases determine where I can pass through. Attacks of enzymes at every step.

They try to break me as I pass. Seeking out my parasite targets hiding in the grain of the liver. In the nooks of the spleen and crannies of marrow. I seek out their macrophage homes.

Does it hear the message of my arrival? A creak on the floor. A latch turning. I have come for my target. I am its death.

Ghost_Horde: In the WCAIR labs they are developing drugs to cure leishmaniasis in humans. This assassin story is like an airport novel as it tracks down its target.



Visceral Media: This site is only online, check out the website for links to international *Leishmania* news stories and educational videos from around the world. **para-site-seeing.org/visceralmedia**



The Out of Body Experience of Leishmania

Rod Dillon (artist & scientist)

This exhibition was based on two separate strands of related scientific research; scientists at Dundee are developing new drugs to treat patients with leishmaniasis and scientists at Lancaster are looking at ways to prevent people from being bitten by the sand flies that transmit *Leishmania*. Behind these simple statements is an amazingly rich narrative about a single celled parasite that does jaw dropping things; one minute living inside the gut of an insect and the next, burrowing inside white blood cells in a warm blooded mammal. The opportunity to produce a multi-layered digital art work and then a physical art exhibition to convey some of this awesomeness was for me, a dream come true. Literally. You know those films of people swimming with dolphins? Well, my dream has been to swim with *Leishmania*, clinging to its smooth body behind that long sinuous flagellum.

We are so caught up in our anthropocentricities, programmed automatically to think about 'improving' the human condition that we seldom think deeply from the perspective of other organisms– particularly microorganisms. The digital artwork grew out of an initial idea to see life from the perspective of the *Leishmania*. As we started to collect the images and write the text for the social media outputs I started to notice and think about elements of *Leishmania* that hadn't really occurred to me in the past. The artistic approach enabled me to have my own out of body experience, I started to think more deeply from the perspective of the parasite. I became obsessed to the degree where I was filming myself pretending to be *Leishmania* in a sand fly whilst on holiday. The creation of the LdBOB Twitter account was another step into this other body. How was LdBOB going to address itself? What gender was LdBOB? *Leishmania* are usually asexual clones that reproduce by splitting down the middle to produce two so-called daughter cells. But LdBOB couldn't really be he or she and was 'it' to be I or we? Suddenly we were into the world of gender politics with a non-binary parasite tweeting about meeting their ancestors. The *Para-Site-Seeing* artwork became an alternative window into the life of *Leishmania* alongside the established, massive scientific digital footprint of *Leishmania*.

Then came another reminder of the general awesomeness of Leishmania and the scientist's love/hate relationship with this parasite and the insects that transmit them. For millions of years Leishmania had inhabited the bodies of reptiles and mammals, being conveyed between animals by sand fly transporters, unseen by humans. Human history relates that Leishmania were first grown in a test tube in the early 1900's, the ability to grow the parasite in the lab was a first step to finding drugs to control leishmaniasis. But what did this mean from the perspective of the *Leishmania*? A sudden leap from *in vivo* to *in* vitro and life would never be the same for LdBOB and co. A few cells of Leishmania donovani taken from a human patient in Omdurman town hospital in Sudan started to live and divide in a test tube, mutant strains were produced and then another landmark event in lives of Leishmania was the ability to cryopreserve them. This was science fiction in fact. Zoom forward within the vanishingly tiny timeframe of 100 years in the evolutionary history of Leishmania and now we have a thoroughly genomed, proteomed and fluorescently tagged LdBOB and cousins sitting cryopreserved in hundreds of labs around the world.

Para-Site-Seeing: Departure Lounge arose from the desire to link the everyday known human experience to the abstract ideas of a parasite being transmitted by an insect and being killed by a drug. There were lots of easy analogies to play with and feed the imagination; my work has focussed a lot on how *Leishmania* overcomes the physical and biochemical barriers to their transfer between each animal and

how they are able to hitch a ride with sand flies. Again here, we get to see something of the multiple scales that work on *Leishmania* encompasses. I can talk at length about the transformation and forward migration of *Leishmania* within the gut of the tiny (1mm length) sand fly. If we prevent forward migration, we can stop transmission and the spread of the disease. Zoom out and we are confronted by the crisis of Syrian migrants with disfiguring cutaneous leishmaniasis. Art gives us a wonderful platform through which to explore these stories.

For me there is no barrier between the art and science of *Leishmania*, there is a common creative desire to dwell on their deadliness and beauty. The artistic and scientific processes of revealing those details required some dreaming but then dogged persistence and a ridiculous amount of hard work!



Dealing with the Deadliness of Parasites

Jen Southern (artist)

For several years Rod and I have discussed the intersections between our work in art, science and mobilities research, and the ways that the *Leishmania* parasite is mobile at different scales and within and between bodies, laboratories, and countries. So for this commission we began by asking scientists at Lancaster University and *W*CAIR to draw maps of the mobilities in their *Leishmania* research, revealing journeys through research careers, of biological materials travelling between laboratories, of cultural and scientific histories, and daily laboratory routines. By asking what moves, and how it moves, we gathered multiple narratives that are historical, geographical, colonial, organisational, biological and scientific. We told this 'rush of stories' (Tsing 2015:34) on a variety of spatial and temporal scales from the microscopic to the global, and from the seconds of cell division to the millennia of fossilization and evolution.

We think of our collaboration as a para-site, borrowing the term from anthropologist George Marcus to describe a dialogue in which meaning and interpretation are co-produced through conversation, in a mutually beneficial rather than parasitic way. A conversation generated between artists and between art and science. We also try to apply this to the parasite, attempting to think *with* the parasite in order to understand it, not simply to kill it. Through this approach we generated playful narratives from the parasite's perspective, but we also produced a problem. If a para-site is about taking care of the power in research relationships, how could it be ethical to make work that anthropomorphises a deadly human parasite? Is it possible to proceed with care for both the parasite and the humans it affects?

In recent discussions of the Anthropocene, there is often a call for greater care for biodiversity and for non-human life. The beneficial



role of microbes in a multi-species world is something we need to value and preserve. Biologist Margaret McFall Ngai (2017) highlights the current destruction of complex microbial worlds that make all life possible. Social scientist Maria Puig de la Bellacasa (2015) writes about temporalities of care needed concerning soil exhaustion and food security at a microbial scale. In *Para-Site-Seeing* we are working with this liveliness, but also searching for a way to work carefully with deadliness.

Anthropologist Anna Tsing uses the term 'contaminated diversity' to describe how it is only by telling stories that include multiple, complex and problematic histories, and in which positive and negative are inextricably intertwined that we can hope to learn from and respond to the complexity of our current situations.

If a rush of troubled stories is the best way to tell about contaminated diversity, then it's time to make that rush part of our knowledge practices. Perhaps, ... we need to tell and tell until all our stories of death and near-death and gratuitous life are standing with us to face the challenges of the present. It is in listening to that cacophony of troubled stories that we might encounter our best hopes for precarious survival.

(Tsing 2015:34)

In *Para-Site-Seeing* we articulate the contaminated diversity of *Leishmania*. In laboratory conditions the parasites are isolated from bodies and from their troubled histories, enabling mass testing to try to find a cure for leishmaniasis. Within blood cells and bodies however, *Leishmania* exist alongside co-infections (particularly HIV) and even contract viral infections of their own. When transmitted by sand fly, or passed between drug users on needles, there is evidence that infection is different from parasite lives in the laboratory. To care in this context is to acknowledge that human, and most notably European, colonial histories are part and parcel of the disease, and that local conditions and politics matter in how the parasites can spread.

Para-Site-Seeing tells a rush of accessible stories that explore the multiplicity involved in producing science. Through caring both for and about the mobilities of *Leishmania* the work revealed the parasite in all its contaminated diversity, at large in the world as well as in the laboratory. By thinking through art, mobilities and scientific research together, we can approach deadliness with care.

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Incubating Cultures

Sarah Cook (founding curator of LifeSpace Science Art Research Gallery)

The curated programme at LifeSpace Science Art Research Gallery (founded in 2014, running until the Para-Site-Seeing project in 2018-2019) addressed both current scientific research (such as that of Professor Miratul Mugit into Parkinson's, dementia and the genetic workings of disorders caused by loss of neurons in the brain) and themes of deep material and philosophical concern to artists (how might the working of the mind be represented?). While these enquiries were, surprisingly, not always that far apart, balancing the two across four exhibitions per year was nevertheless a delicate operation. Too much emphasis on the science turned the artists' works into little more than illustrations, whereas too much 'insider' referencing on the part of the artists perplexed the scientists. Both art and science have their own shop-talk languages - terminologies and ways of working — that are unknown to the other. What I, as curator, might have seen as a distinct aesthetic choice by an artist - whether a particular edit in a narrative or use of a display technology - my fellow scientist might have read as an indulgent, or worse, naive choice, simply because they didn't have the same frame of reference (and encyclopaedic knowledge of art history, natch!) as me. A life scientist can recognise an image of a fighting white blood cell at 100 paces, I am more likely to have only ever seen one in cartoon form, a squiggly figure either frowning or punching the crap out of a virus. This difference in language - visual and textual - has long been referred to as the two cultures problem. For this reason, LifeSpace sought to be an incubator for entirely new cultures, and the project *Para-Site-Seeing* is an example of that.

Incubation is an apt metaphor here. Who doesn't love the story of the accidental discovery of penicillin by Fleming — who went away for his summer holiday leaving all his dishes stacked up in the lab going mouldy and when he got back noticed something 'funny', in his words, about the 'mould juice'. If the drug discovery process is a mystery to some, then so is the process of the creation of a work of art to others. Are we all equally fascinated by art works that use drugs in their fabrication, because the sourcing of pills is also a mystery given they are controlled substances? Think of Damien Hirst's *Pharmacy* (1992), in the collection of the Tate, which displays thousands of packets of different drugs (though in fact the packaging is empty, but a round-the-clock security guard is needed nevertheless) or his Pharmaceutical series of 'spot paintings' (1994-) named after drug compounds. With the development of synthetic biology, artists have also proposed the creation of drugs as art works, such as Alexandra Daisy Ginsberg and James King's speculative design project, E.chromi (2009) (created with a team of undergraduate science students at Cambridge) which imagines a yogurt drink full of good bacteria with sensors and colour coding built in, so that the colour of your faeces becomes a diagnostic tool (Pink poo? You've got Salmonella poisoning!), or Heather Dewey Hagborg and Phillip Andrew Lewis's proposal to engineer house plants with the genes of lost loved ones, creating memorial gardens in more way than one (Spirit Molecule I was exhibited at LifeSpace in 2018). Juliette Bonneviot's paintings (2015) shown at LifeSpace in the exhibition hormonal (2016), are created with compounds she has mixed herself from everyday objects that contain endocrine disrupting xenoestrogens (her Peace Green work lists its materials as 'lead, cadmium, aluminium, aspirin, oestradiol, soy, pesticide, silicon rubber'). Drugs and their meaning in society might be very different from their significance in the context of scientific discovery, and artists are good at reminding us of those worldly and cultural differences.

A little like *E.chromi*, *Para-Site-Seeing* has a speculative narrative framework, but takes that narrative a step back, from the drug, imagined rather than actual, to the reason it is being created — to fight a parasitically transmitted disease, and where it all came from. As a multi-sited work of art, *Para-Site-Seeing* is a playful experiment

in telling the story of pharmacokinetic drug discovery in the context of an interdisciplinary academic research unit. This description doesn't communicate an immediate visual picture of the work, which is fitting, given that the parasite, the means of its transmission, and the molecular mathematics required to engineer its killer, are also hard to picture. Imagine a pile of mouldy-juice-filled petri dishes and you might get a sense of the laboratory side of the work; in *Para-Site-Seeing*, the artists collaborated with scientists to film and photograph the movement of both the parasite, and the drug compounds, around the [sparklingly clean and tidy] lab, as if it were on its summer holiday, not Fleming.

Para-Site Seeing was initially an online work — what is sometimes called 'born-digital' — in its now archived form as a series of short web stories (a succession of tweets or posts). And then it became a physical installation displayed in a gallery space. And now it is in this book in your hands. In this, the art work itself has gone through a series of iterations — tests and refinements, as any drug compound might also — in its aim for greater effectiveness, communicated in both a text and visual register through scripts, poems, videos, photographs, sculpture and printed matter. This kind of 'liveliness' is not something often associated with art works, which are imagined to be fixed in a time and place, unchanging in their life in the museum or gallery. But this is an outdated notion of art particularly when it comes to art/science collaborations, and one reason why it challenges both art history and museums and galleries to widen their definitions of the practices and processes of art and design.

Art historian, Treva Michelle Legassie, has usefully noted the idea of 'the encounter' as regards bio art specifically. She terms this 'presence' and situates it alongside ideas of liveliness:

the relationship between the human body and a present work of bio art generates visceral and embodied models of viewing that are necessary to consider in the context of critically curating art-science practices [...] In order to ally the curatorial with the lively and present quality of bio artworks, one should address their shared interest in the communication of new forms of knowledge through the mobilisation and visualisation of research by way of creative practice. [...] From this perspective, the curated exhibition of bio art could act as a form of knowledge production that can illuminate something new about science for the public. (Legassie 2018:74)

Imagine you are visiting an exhibition about the discovery of penicillin. Do you see a re-creation of Fleming's messy lab bench? Is the bacteria alive? Imagine you are visiting an exhibition about the discovery of a cure for leishmaniasis? What do you see? Current museum practice is challenged by the prospect of collecting contemporary science — does the museum collect the equipment used in experiments (once that piece of equipment has been made redundant — like a freezer or a centrifuge?) or the paper published in the journal (ideally under open access standards and rules)? How does the secrecy of contemporary scientific research affect how the liveliness of scientific methods is made manifest? Does that secrecy extend to the findings or the experimental methods or both, and until results are published or until the drug in question is potentially patented and marketed? Any future encounter with a work of bio art will raise these questions and others besides, depending on what else of the context of that moment of scientific discovery has also been preserved.

All biological life science research, as with any other aspect of human endeavour focused on the future (as scientists like to reinforce), is difficult to historicise 'as it happens' and often the historicisation of developments in science have focussed on the trappings of the scientist or scientists in question (with a biographical approach to the collecting of archivally sound artefacts or documents representing their life and activities, such as lab books. Collecting mouldy-juice just isn't something a museum is inclined to do). With *Para-Site-Seeing,* fictionalising the accounts of activity, and telling them from the parasite's-viewpoint in both photo and text has turned out to be just as powerful as the accounts of the scientist 'chasing down' the parasite and mitigating for its effects. Whether materially-stable, and suitable for a future museum or not, the born-digital artwork has an undeniable thing-ness and liveliness about it which is worth valuing.

Should any of the drugs currently in development at the Wellcome Centre in Dundee prove to be the future cure for leishmaniasis, then these stories, written by artists in collaboration with scientists, may well do as much as any piece of obsolete equipment or packet of pills to tell future generations about the processes behind this achievement.

A longer version of this essay is in print in the anthology Curating Lively Objects: Post-disciplinary museum perspectives, edited by Caroline Langill and Lizzie Muller and published by Routledge.

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Juliette Bonneviot, Red Xenoestrogens (detail), Cadmium, copper, E127, BPA, PVC, 2015. Juliette's work was included in an exhibition at LifeSpace in 2016.



Journeying across disciplines: art and science get engaged

Ali Floyd (Public Engagement Manager, Wellcome Centre for Anti-Infectives Research)

What is public engagement with research? The National Coordinating Centre for Public Engagement is the UK's central hub on the subject. They define it as "by definition, a two-way process, involving interaction and listening, with the goal of generating mutual benefit." (The National Coordinating Centre for Public Engagement, n.d.)

Why does this matter? Well, it shapes the way that we think about this kind of work. It takes public engagement from the realm of handing out information into something more of a conversation. What do people really think about what we do as researchers? Is *Leishmania* important to people here?

Why would anyone in Dundee be interested in Neglected Tropical Diseases?

This is the question I was asked by a colleague at the outset of the Wellcome Centre for Anti-Infectives Research. It's an interesting one. Dundee is a fascinating city. Exploring the news for items about the city brings up an interesting mix; football (The Courier, 2019), crime (The Courier, 2019), food parcels (The Courier, 2019) and community (The Evening Telegraph, 2019). It's a city that was once known as the teenage pregnancy capital of Europe, although this has shown a significant decline in recent years (The Evening Telegraph, 2015), in parallel with the city's redevelopment. Still, there are significant areas of deprivation and social challenge in Dundee (The Scottish Government, 2016). Why should helping people so far away be important?

Mutual benefit

Of course, the story is a great deal more complicated than that. The

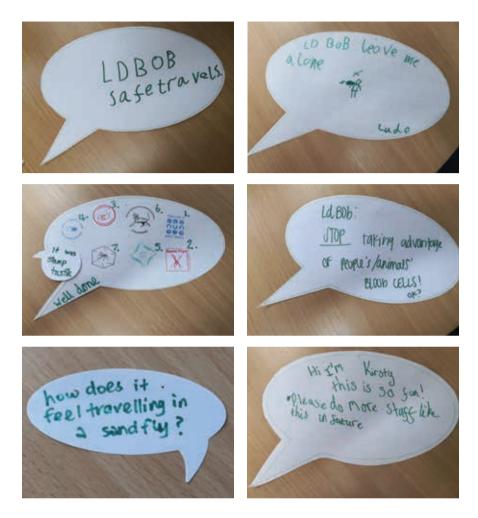
University of Dundee is one of the biggest employers in the city (Scots-JobsNet, 2014), bringing prosperity to many. It also brings in other benefits; outside voices, new and talented people, many of whom stay and make a home here. Dundee also has a long history of helping others; Mary Slessor is a heroine in these parts (The Mary Slessor Foundation, 2015), famed for her work in Africa, one of the many Wimmin' o'Dundee who kept the bairns fed (Wellington, 1990), all around the world.

And that's what this kind of science art project can do.

Our building is a large, imposing part of the Dundee skyline. Bright and white, it can feel like an ivory tower, not for those who don't work here. Using art can be a way to positively encourage people into our spaces, to make them feel welcome. Having friendly, approachable interpretation is vital if we don't want to scare them away. A hot cup of coffee can help too. Once we create an environment that goes from threatening, to non-scary to downright friendly, we're in a better position to have a two-way conversation.

What have we learned from our publics? We've used a few different ways of conversing, but perhaps the most interesting has been encouraging people to create their own visual responses to the exhibition, which in turn became a part of it. We asked people to write or draw a message to LdBOB, the parasite. Over 100 of these messages were created, which gave some fascinating insights into people's experiences. Some were written, some drawn.

Some, from younger visitors, showed either a fear of the parasite or a friendly familiarity with it. While others engaged with the questions we raised about what gender and sexuality might mean to a parasite. One young visitor was particularly engaged by the process of stamping. They decided that it would be helpful to rank them from most- to least-favourite, with the description of the overall exhibition as "stamptastik":



We also saw a theme of people being interested by the animals mentioned in the exhibition. Both dogs and sand flies were mentioned as was the idea of taking over cells.

And finally, there were other speech bubbles which simply expressed how much people had enjoyed their *Para-Site-Seeing* trip.

The last one was from a particularly interesting school group from a relatively deprived school in Dundee, and a younger audience than we had planned for. The adults who visited with them were deeply surprised at how well they engaged with the work, even sitting peacefully in the sand fly gut discussing their experiences of the show.

We're really interested in the idea of science capital, the idea of how much science is 'for you' (Science Museum Group, 2015). Such friendly, positive feedback suggests strongly that people felt the exhibition was for them. In the long-term, we know that people who feel this closeness find their way to broader opportunities in the world of science in their future. In a city like Dundee, where there is a close mix of deprivation and world-leading science, giving people these opportunities could lead to changing the course of young lives.

It also fits in with Wellcome's strategic aims for public engagement (Wellcome, 2019). They are focused on empowering people and helping them to think critically about health research — questions like 'why do we research Neglected Tropical Diseases in Dundee?', for instance.

If public engagement is to generate mutual benefit, what have we as researchers gained from it? Certainly, more people are aware of our work than were before. The exhibition brought a much greater number of people into LifeSpace. It has also begun its own *Para-site-seeing* trip, thanks to a developing partnership between the Wellcome Centre for Anti-Infectives Research and Dundee Science Centre. Our ambition is to use this work to reach publics internationally, to both tell them about our research and to learn more from them.

So why would people in Dundee be interested in Neglected Tropical Diseases?

It turns out that there are several answers. One is that people seem to have found them genuinely fascinating. More than that, they have been a stimulus for conversation, and a place to grow people's science capital. Beyond the idea of diseases, we want this work to be an agent for changing lives.

Author Biographies

Sarah Cook

Sarah Cook is Professor of Museum Studies in Information Studies at the University of Glasgow and one of the curators behind Scotland's only digital arts festival, NEoN. Sarah has curated exhibitions internationally including 24/7: A Wake-up Call For Our Non-stop World (Somerset House, 2019) and published widely on media art including INFORMATION (Documents of Contemporary Art, Whitechapel and MIT Press, 2016). www.sarahcook.info

Rod Dillon

Rod is a scientist/artist and Senior Lecturer in Biomedicine at Lancaster University. Rod has spent 40 years researching the interplay between insects, microbes, plants and humans with current focus on *Leishmania* and Brazilian sand flies. He is working on projects in Middle East, Africa and Brazil. @sandflyman www.roddillon.com

Ali Floyd

Ali has previously worked for Glasgow Science Centre and Edinburgh International Science Festival. At the National Museum of Scotland, he was a key player on the Masterplan Phase 3 project. Within WCAIR, he has led on science art projects such as *Para-site-seeing*, creating new theatre with Dundee Rep: Engage, and community engagement.

Donna Holford-Lovell

Having worked as a curator at University of Dundee (DJCAD) and Abertay University's Hannah Maclure Centre for many years Donna decided to escape the institutional shackles and set up Fleet Collective, an artist collective dedicated to housing a collaborative working practice for local digital artists. Donna co-founded NEoN in 2009 and is now its full time Director. NEoN aims to advance the understanding and accessibility of digital and technology driven art forms and uses the festival platform to do this. @holfordlovell www.northeastofnorth.com

Jen Southern

Jen Southern is an artist and Senior Lecturer in the School of Art at Lancaster University where she is also Director for Arts at the Centre for Mobilities Research. Her work exploring mobilities in the relationships between art, technology and non-human lifeforms has been exhibited internationally for over 25 years. www.theportable.tv

Holly Yeoman

Holly Yeoman is a curator, producer and lecturer. Holly was the temporary curator and project manager of LifeSpace Science Art Research Gallery, Dundee (February — August 2019). Prior to this she was the curator of Summerhall, Edinburgh (January 2015 — August 2016), which included co-curating Edinburgh International Science Festival exhibition programmes.

Para-Site-Seeing and *Para-Site-Seeing: Departure Lounge* are artworks by Rod Dillon and Jen Southern.

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Elektra Dominica sand fly in resin imaging: Alan Prescott (Dundee Imaging Facility) Leishmania.we & LdBOB Written by Rod Dillon & Yasmine Kumordzi Freezr_Cat3 laboratory videos: Lesley-Ann Pearson (WCAIR), Lorna MacLean (WCAIR), Jen Southern Sand_flyer videos: Rod Dillon Unleished and passport stamps drawings: Leonie Robertshaw Unleished newspaper articles: Jen Southern & Rod Dillon Sand fly Scanning Electron Microscope Images: Alan Prescott (Dundee Imaging Facility) Ghosthorde text: Kevin Read (WCAIR) & written by Stuart Nolan

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