



## Sainsbury Wellcome Centre

Sainsbury Wellcome Centre, 25 Howland Street, London, W1T 4JG +44 (0)20 3108 8004 [ucl.ac.uk/swc](http://ucl.ac.uk/swc)

### SWC PUBLIC ENGAGEMENT FUND - APPLICATION FORM

<b>Applicant name</b>	DANBEE KIM
<b>Email address</b>	<a href="mailto:Danbee.kim@ucl.ac.uk">Danbee.kim@ucl.ac.uk</a>
<b>Application title</b>	"The First VIRS": A Graphic Novel Neuroscience Thesis
<b>Amount requested (up to £1,000)</b>	£9,360.00
<b>Date of Public Engagement Training attended</b>	Jan 23 and 31, 2018 (Public Engagement Skills: Train and Engage, sessions 1 and 2); June 6, 2018 (Intro to Public Engagement)

#### Q1 – What is the main challenge you are trying to solve with this project?

There is a growing mistrust between those who work on basic science research and those who do not, in large part due to a lack of accessible communication about the research, the costs of which are often publicly funded even while the results are not made publicly accessible. This mismatch has had severe consequences in recent years, from policy-makers deciding to "cut indirect costs" and decrease public funding for basic science research, to a complete lack of mobilization over the global environmental crisis. The growing mistrust is also exacerbated by the inexplicable increase in the cost of higher education paired with the lack of jobs even for university graduates, and the overburdened teaching resources of primary and secondary schools all over the world, leading the current generation of youth to question the inherent value of in-depth study over any endeavour that can generate a large amount of money.

Trust is built upon a foundation of good communication, and this project seeks to deliver accessible, in-depth communication about neuroscience research and how it can play a direct role in the everyday lives of anyone.

Neuroscience offers a unique set of challenges and opportunities for a more intimate connection between research and engagement. As detailed below, interest in how the brain controls and learns adaptive behaviour is not just a question asked by neuroscientists; it is central to every human and their lifelong effort to understand themselves and others. This project is our attempt to tap into this "latent" expertise, and to explore how science fiction combined with science education can more effectively stimulate contributions of the general public to neuroscience research, and contributions of neuroscience to public education and well-being.

#### Q2 – Who is the intended public audience for your project and how will you reach them?

The intended public audience for this project is any science-curious person above the age of 12. To reach them all, this project communicates neuroscience concepts via the comic format, formally defined by Scott McCloud in "Understanding Comics" (1993) as "juxtaposed pictorial and other images in deliberate sequence, intended to convey information and/or to produce an aesthetic response in the viewer". By using this powerful storytelling format, the project hopes to transcend language and expertise barriers without losing the nuance and complexity of the topics addressed. The resulting graphic novel will be made digitally available for free under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License, and an initial run of approximately 30 print copies, to be distributed to various communities outside the academic





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research community, will be sponsored by the Kampff Lab. Further distribution outlets, including submission to science writing competitions and online collections, will be pursued upon completion of the work.

### Q3 – What are the main aims of your project and how do they tie into research at the SWC?

This project is a collaboration with 16 artists to speculate, in graphic novel storytelling format, upon a future in which humans have organized societies and communities based on a "neuro-centric" perspective, as opposed to a "techno-centric" perspective. This speculation feels necessary in large part due to the overwhelming drive in current society to focus humanity's efforts on prioritizing the "techno-centric" perspective, a trend which Oliver Sacks observed with great distress:

"I cannot get used to seeing myriads of people in the street peering into little boxes or holding them in front of their faces, walking blithely in the path of moving traffic, totally out of touch with their surroundings. I am most alarmed by such distraction and inattention when I see young parents staring at their cell phones and ignoring their own babies as they walk or wheel them along. Such children, unable to attract their parents' attention, must feel neglected, and they will surely show the effects of this in the years to come.

[...]

What we are seeing—and bringing on ourselves—resembles a neurological catastrophe on a gigantic scale." (Oliver Sacks, "The Machine Stops", published post-humously on Feb 11, 2019 by The New Yorker)

Towards fighting this "neurological catastrophe", this project has two main aims.

The first is to point out the shortcomings of "computationalism", the modern interpretation of a statement by influential psychologist William James in his 1890 book "The Principles of Psychology": "The whole neural organism, it will be remembered, is, physiologically considered, but a machine for converting stimuli into reactions." As Paul Cisek stated in his 1999 paper "Beyond the computer metaphor: Behavior as Interaction": "In its broadest sense, computationalism may be crudely defined in terms of the following analogy: perception is like input, action is like output, and all things in-between are like the information processing performed by computers." The research being conducted by the Intelligent Systems lab at the SWC has been contributing to a growing body of evidence from many corners of brain science and related fields that suggests that computationalism's description of the nervous system is incomplete and misleading, and "can be easily extended toward a more productive description of brain function without giving up many of its accompanying concepts" (Cisek, 1999, p.2).

The second aim is to communicate these shortcomings of computationalism to the "myriads of people in the street", and to dispel the myth that to do neuroscience research requires one to be a "genius". Neuroscience is a unique discipline of research because the topic of study is used by every human every day to navigate our rich and complex society; therefore, a lay person's knowledge about the role of the brain in their own behaviour and the behaviour of others is significant, and a source of valuable insight. By using the comic-book format to communicate cutting-edge neuroscience research, this project aims to start a conversation between neuroscientists and anyone who uses a brain; and to empower parents, teachers, students, artists, and anyone else who is "neuro-curious" to re-direct their efforts for improvement and



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greater understanding to their own brain and behaviour, as opposed to placing a blind trust in technological gadgets and entities.

These aims meet the research missions of our funders here at the SWC, which include UCL and the Wellcome Trust. As stated in a letter of support for this project by Helen Craig and the UCL Culture department, "We see work like this [graphic novel] as essential to achieving UCL's core mission of transforming how knowledge is created and shared – and in enhancing the university's impact on society. The new UCL Research Strategy for 2019 also highlights the importance of this area, with one of the three aims of the strategy being crossing boundaries to increase engagement between disciplines, communities and activities" (see attached letter). The Wellcome Trust has also explicitly published their desire to fund diverse and innovative public engagement projects, and has described itself online as such: "Wellcome exists to improve health for everyone by helping great ideas to thrive. Our investment portfolio gives us the independence to support scientists and researchers take on big problems, fuel imaginations, and spark debate."

Finally, discussing the pros and cons of a neuro- vs. techno-centric approach to science, and the potential outcomes for our society, is a debate uniquely suited to the mission of the SWC/GCNU. As one of the only examples of a joint computational and experimental neuroscience research institute, we are both uniquely equipped, and uniquely obligated, to explore the relationship between machine and biological intelligence, in as many forms as possible.

#### Q4 – What will happen during your project? Please provide a brief summary.

Beginning in May of 2018, Danbee Kim has developed a story script which has been published under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License on the github repository found at url "[www.github.com/taunsquared/graphic-novel-thesis](https://www.github.com/taunsquared/graphic-novel-thesis)". During the summer of 2018, Danbee made a global open call for artists to collaborate on the graphic novel thesis. By September 1, 2018, artists were interviewed and confirmed as collaborators on the project. By November 30, 2018, the script was "frozen", meaning no more significant changes were allowed to be made after that date without the approval of all project collaborators. On February 8, 2019, the first project milestone, consisting of black-and-white illustrations with lettering and typesetting tests of un-illustrated pages, was presented in the Intelligent Systems lab weekly lab meeting. The project is aiming for completion by March 15, 2019, in order to be integrated into Danbee Kim's final thesis document, which will be submitted in early April 2019. Following thesis submission, the graphic novel will be submitted to competitions promoting science writing and to a number of online publishing outlets with specific open calls for alternative visions of our techno/science future (e.g. ArsTechnica).

#### Q5 – How will you evaluate your project and assess whether you have achieved your aims?

Danbee Kim will solicit feedback from her thesis committee, thesis advisor, labmates, collaborators in other disciplines, students (at the university, secondary, and primary levels), friends, family, and strangers on the internet. If anyone besides the thesis committee (the only entities listed who are professionally obliged to read and evaluate the project) is able to read and enjoy the project in full, this will be considered the first level of achievement. If anyone outside the academic neuroscience research community engages Danbee Kim in conversations about the graphic novel, this will be considered the second level of achievement. If the graphic novel proves popular enough to warrant another round of physical print publications, this will be considered a third level of achievement, and represents our ultimate goal for this project.





**Q6 – What lasting impact will your project have?**

This project is meant to ensure that people besides the academic neuroscience research community will have access to the nuances of a very current debate in neuroscience. Danbee Kim, her thesis advisor, and their colleagues believe that changing from a techno-centric perspective to a neuro-centric perspective will have enormous implications, not only for neuroscience research and related areas of research, but also for the day-to-day decisions of every human on the planet. This project represents a first attempt to both outline this perspective and to disseminate it to the non-academic public. Building on this work, we plan to pursue additional projects, in a range of formats, to further highlight the promise of a neuro-centric approach to our collective future.

**Q7 – What is the timescale for your project?**

May 15, 2018 to March 15, 2019.

**Q8 – Please provide a breakdown of how you plan to use the amount of money requested.**

Artists will be paid £40.00 per page of illustration submitted, including separate payment for the black-and-white/inked version of pages submitted for Milestone 1 and the coloured version of pages submitted for Milestone 2. Artists are divided into 3 categories:

- Chapter Illustrator: chapter illustrators will be responsible for illustrating a full chapter, which consists of 12 pages each, and character designs for main characters who will appear in multiple chapters. Because each chapter is illustrated by a different artist, these character designs are crucial for helping the reader keep track of the main characters in their various visual forms. The number of character designs for each chapter vary. This means that at each milestone, chapter illustrators will be paid £480.00 for the 12 pages of story, and between £120.00 (3 characters) to £280.00 (7 characters) as additional pay for character designs.

- Concept Artist: concept artists will be responsible for illustrating a page of concept art, to be used as the chapter title page for each chapter or as the title page of the entire graphic novel. This means that at each milestone, concept artists will be paid £40.00.

- Dream Sequence Illustrator: the dream sequence illustrator will be responsible for illustrating the 3 dream sequences that appear in the plot, which will be used to create a visual thru-line throughout the graphic novel. Given that the dream sequences consist of 7 pages, this means that at each project milestone the dream sequence illustrator will be paid £280.00.

Please see the attached budget spreadsheet for a full breakdown of costs involved in this project.

If you are successful and awarded funding for your project, you will be asked to:

- 1) Attend meetings and provide updates to the SWC Communications Manager
- 2) Provide images and information to promote your project on the SWC social media channels
- 3) Complete an evaluation report at the end of your project
- 4) Prepare a brief case study that can be used on the SWC website

Please tick the box below to indicate that you are happy to take part in the above activities as a condition of funding. ☒

**Please submit your application by midnight Thursday 31<sup>st</sup> January 2019 to:**

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