VICE-PRESIDENT'S AWARD WINNER 2012

Artistic interpretations of the microworld

Microscope images have long captured the imagination of the public, providing a valuable link between scientific and lay communities. The purpose of this 12 month-project is to liaise with artists to produce works that are quite different to the micrographs from which they are derived, to allow their wider appreciation to non-scientific audiences.

Background

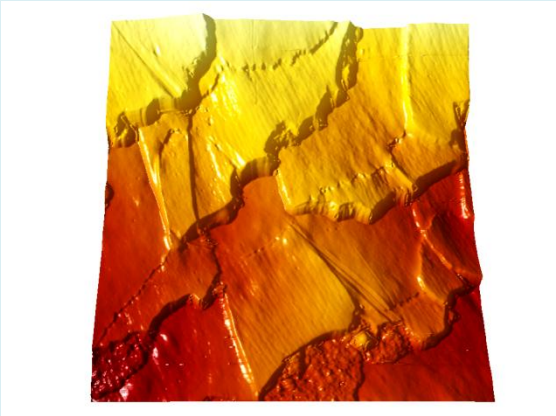
There are many splendid examples in the popular media and scientific literature of art being used to portray science, particularly those using microscope images. Indeed, you can now purchase such works on canvas, key rings, mugs, mouse mats and suchlike. The idea of this project though is for artists to 'respond' to micrographs, adding something extra to their artworks rather than a simple 2D- or 3D-representation of the images using artistic media, although this too is of value.

To achieve these aims, a focus is being placed on atomic force microscope (AFM) images of hair and DNA. These materials are of public interest and offer a wealth of structural complexity. In the case of hair, for example, despite decades of research, a detailed understanding of the cuticle sub-layers, necessary for the development of cosmetic treatments, has remained fairly elusive. DNA-protein interactions are of interest in genetic engineering, where future tailor-made medicines are anticipated. Importantly, however, for this project, DNA and hair also elicit emotive responses due to their contribution of 'self'.

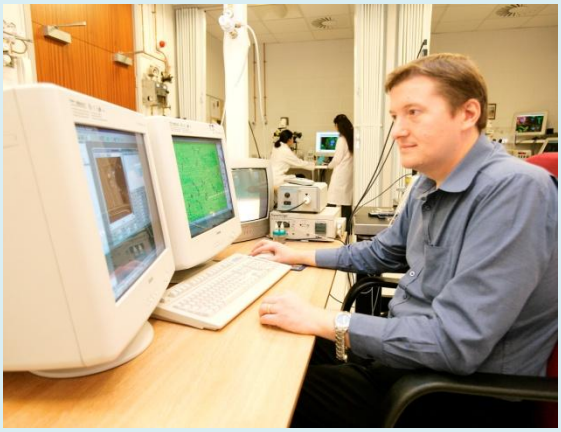
AFM images

AFM images have been obtained Dr James Smith, a Senior Research Fellow at the University of Portsmouth. Images were selected based on their best conveyance of scientific concepts, such as scale, processes, disease states, complexity, orientation, fine

structure, and other information, such as inheritance, origin and age. The micrographs are a combination of new scans and those chosen from an extensive library of previously imaged specimens at Portsmouth. AFM was considered to have an advantage over other types of microscope in that 3D images could be produced and in a variety of palettes, perhaps making them more accessible to artists.



An AFM image of the surface of human hair



Dr James Smith using the AFM at University of Portsmouth

The artists

A number of artists are contributing to the project. Jacqui Lea has worked in a range of community education and creative projects. She leads Hopeweavers, a faith-based organisation, based in Southampton, UK, which offers spiritual direction and fellowship for people of all faiths and of none. Creativity is an important part of their ministry.

Jacqui Lea from Hopeweavers

Hopeweavers also provide tutors and support for a community-based art group, Thornhill Art Group (TAG), offering a creative/learning resource to local people on an estate of social housing, on the Portsmouth-side of outer Southampton. Thornhill has benefitted from urban regeneration money over the years and has a large number of walk-up blocks.

Thornhill, Southampton

Jacqui Smith also has joined the project. She is a self-taught flautist and plays in the Charity Symphony Orchestra and Pops Inc UK. She has also played with the BBC Symphony Orchestra and Bournemouth Symphony Orchestra.

Jacqui Smith

Artists Lynda Owen-Hussey and Sandie Schulkins are also contributing to the project, together with other artists visiting TAG sessions.

Lynda Owen-Hussey

What has happened so far?

AFM images of hair and DNA have been shared and explained by James Smith on a visit to TAG. The group were very excited about the project and asked many questions, such as 'What about curly hair? How does gray hair differ? Are the cuticles stuck down or can they flap about? How does DNA become damaged?'

On a separate occasion, the images were also shared with the non-TAG artists. It is becoming obvious that there are many tiers of public understanding being facilitated by this project: scientist-to-artist, scientist-to-TAG, artist-to-TAG, not to mention the later goal of artist-to-general public *via* exhibitions. There will undoubtedly be an artist-to-scientist response, especially judging from the number of questions raised so far.

To further disseminate information about the project as well as to expand the science/art/public dialogue, a dedicated website has been set up: www.microworldreflections.com. An important feature of this website is the blog section, which provides a means of informally sharing thoughts (scientific, artistic and organisational) as the project progresses, both between team members and anybody else who wishes to 'tune in', offering a behind the scenes look at unfolding project developments.

Jacqui Smith has started making artistic responses to images in the form of music compositions. These are mainly being written using Sibelius 7 software and the plan is to record pieces on flute, with some accompanying instrumental backing. The initial idea was reinforced on hearing a CD 'Images & Impressions: Music for Flute & Harp' by Judith Hall and Elinor Bennett that Jacqui had listened to in December.

TAG members, and other artists, have also submitted hair samples (15 people in total) for AFM scanning. This was thought to add another personal touch to the project, with the understanding that a single snap-shot of their hair is not a representative sample.

Scanning was completed in February 2013: 4 images per sample were obtained, two from the root end and two from the tip end.

Hair samples from TAG members

Expectations

The TAG members will visit the University of Portsmouth, *via* a coach trip, on April 10th where the group will observe a few samples being imaged and have the opportunity to ask questions. There will also be a PowerPoint presentation where the hair images will be discussed. TAG members will be given a number that will identify their hair images being presented whilst keeping the images anonymous to fellow members. Similarly coded micrographs will also be posted on the website for artists, scientists and the general public to make comparisons. TAG members will also be given photographs of their hair micrographs that may help them with their artistic interpretations. DNA imaging and profiling of TAG members is not planned!

In the next stage of the project, the artists will be left to produce their artworks from the various images. James Smith will be on-hand for any clarifications etc, but will generally try not to interfere! His efforts will be directed towards maintaining the website and managing the project.

Hopeweavers involvement in the project is an interesting one. They use a variety of media, sometimes encompassing a spiritual dimension to their work. To clarify, the spirituality in question may or may not reflect a relationship with a divine creator, although promotion of a creationist agenda (*e.g.*, proof of God through bacteria flagella) is certainly not the motive. Rather, a fascination of the intricacies of life, our uniqueness and value that may elicit a variety of emotions, perhaps including those of a religious nature, is the anticipated outcome.

Jacqui Lea will be developing work using as a basis the techniques of carding, spinning and weaving using wool and hair from a variety of sources alongside the micrographs. Working also on drawings and as a painter, she looks forward to sharing her work in progress on the website.

Lynda, Sandie and TAG members will also make artistic interpretations. The latter will be further inspired by visiting artists who will describe and demonstrate different techniques and styles.

Later in the project, exhibitions of the artworks will take place. These will occur at a number of venues, some of which have been identified, but the idea is to reach as broad an audience as possible, including local and national venues, faith, art, public and science communities. The website, with associated social media links, will contain photographs of the artworks and music files and thus will reach international audiences.

In Conclusion

In summary, it is expected that the project will provide a number of different artistic responses that are 'beyond' simple 2D- or 3D-representations of the micrographs. This approach will undoubtedly offer new insights and interests, allowing wider public engagement.

The beneficiaries of the work will be scientific, artistic, faith and general public communities, both locally, including TAG members and others within the Thornhill area, and internationally. This will be achieved through visits, production of artworks, exhibitions and web-based media. Everybody should learn from the experience. We are very grateful to the RMS for receiving this award.

James R Smith
School of Pharmacy and Biomedical Sciences, University of Portsmouth, UK
james.smith@port.ac.uk
http://smithjr.myweb.port.ac.uk
www.microworldreflections.com

Jacqui Lea
Hopeweavers, West End, Southampton, UK
jacquilea@btinternet.com
www.hopeweavers.co.uk

Jacqui Smith
Jacqui Smith Music, Whiteley, Hampshire, UK
Jacqui.smith2004@btinternet.com
www.jacquismithmusic.com

Lynda Owen-Hussey
lyndaowenhussey@yahoo.co.uk

Sandie Schulkins
sandieschulkins@hotmail.co.uk