Babraham Bioinformatics supports life science research worldwide

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The benefits of the Bioinformatics Group's software and services have ranged from facilitating ground-breaking cell biology research that could benefit human health to helping a spin-out company market its products. Bioinformatics at Babraham is supported by BBSRC's sustained investments in the Institute.

"Many of the researchers in the life sciences sector will be using software developed at the Babraham Institute to be able to process their data and get the information they need," says Dr Simon Andrews, Head of Bioinformatics at The Babraham Institute[2].

Dr Pascale Mathonet, Team Leader, Antibody Engineering at biotechnology spin-out company Isogenica says, "We have been working with Babraham Bioinformatics for six years and their help has been very valuable in developing our bioinformatics capabilities. They created some useful tools for us, as well as advising us on longer-term strategic planning. They also trained some of our staff in Perl programming which has helped with streamlining some of our operations."

A vital role

The job of the Bioinformatics Group, which comprises eight people, is to facilitate the computational aspects of research at The Babraham Institute. This is a vital role, as computers are essential to bioscience research in the 21st century, and nearly all of the primary data produced at Babraham is generated using a computer.

"Our job is to make that part of their research easier for the scientists," explains Andrews, "either by taking it on and doing it for ourselves, or by developing tools, providing infrastructure, or offering training."

The group spend around ten per cent of their time analysing data and providing training for academic institutions and companies outside The Babraham Institute, and the rest of their time facilitating research in-house. However, because of the group's policy to make all of their software and training materials immediately available on the internet, even their in-house work benefits researchers all over the world.

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- Researchers in hundreds of academic institutions and companies worldwide can interpret their biological data thanks to open access software and training guides produced by Babraham Bioinformatics.
- For example, Babraham Bioinformatics:
  - are producing software vital to Cambridge Epigenetix's product marketing
  - provided essential data analysis for ground-breaking stem cell research
- Babraham Bioinformatics provide training to researchers and companies on the Babraham Research Campus and further afield.

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“We produce software packages initially for our own use,” says Andrews, “but we are also aware that much of what we develop is going to be useful to other researchers too, so we look to provide open access opportunities whenever we can. We are part of a larger scientific community and sharing information, or providing knowledge exchange of this sort, can help to accelerate research discoveries, avoid duplication of effort and importantly contribute to world-class research.”

Promoting products

The Bioinformatics Group’s software not only benefits academic researchers but also commercial enterprises. One example is Cambridge Epigenetix[3], a University of Cambridge spin-out company.

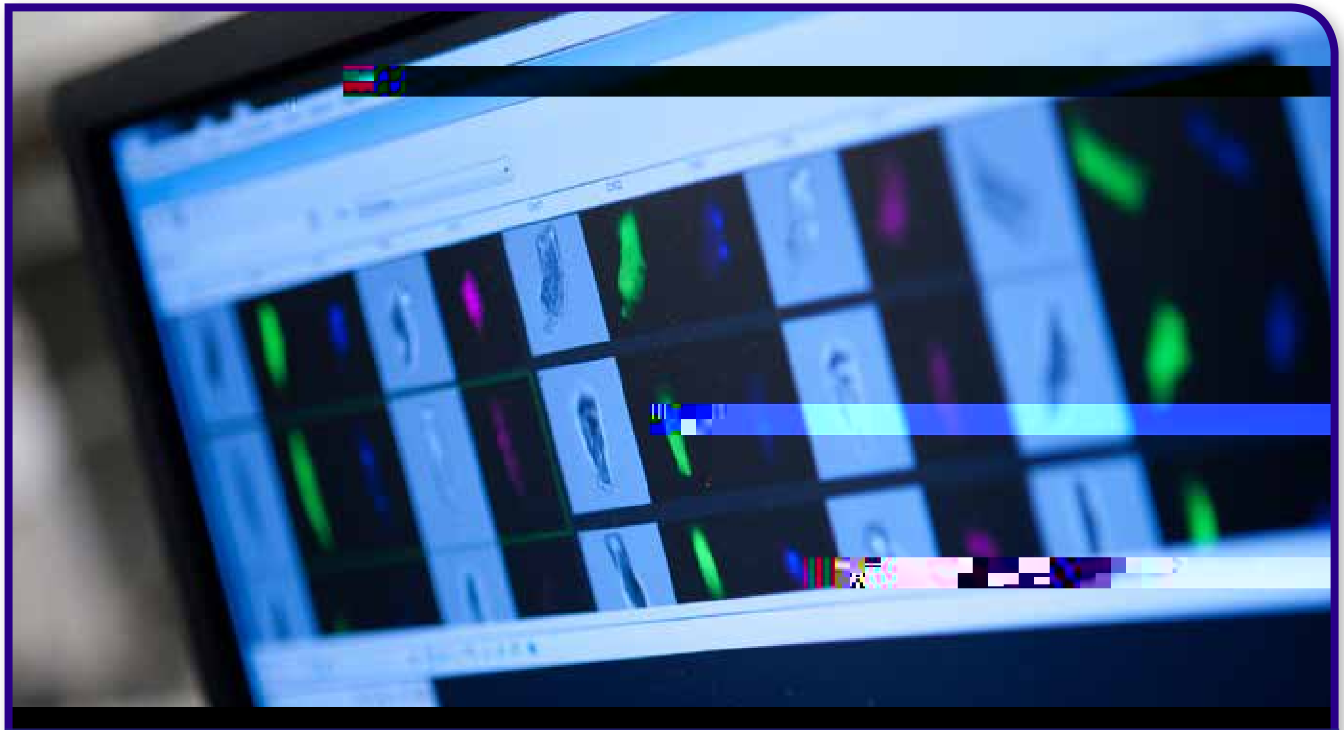
This company produces specialised kits that allow researchers to study chemical modifications on DNA sequences. To interpret and analyse the data from these kits, software is required.

The Bioinformatics Group are working with Cambridge Epigenetix to develop such software. This will be used by the company to promote their products, by demonstrating to customers how the data their kits produce can be interpreted and used.

This software is essential to the company’s marketing of their products and, as a result, they are employing a new member of staff to work within the Bioinformatics Group on its development.

Paving the way for new stem cell research

The Bioinformatics Group’s value to the research community is illustrated by the key role they played in the first large-scale study of how the body reprogrammes cells[4], the results of which have implications for stem cell technology.



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Stem cells – unspecialised cells that develop into different types of cell – can be used to regenerate damaged human tissue. Stem cells from a person’s own body are particularly useful, as there is no risk the body will reject them. The problem is that the only process for changing a specialised adult cell into a stem cell[5] is extremely inefficient.

However, this process occurs naturally in human embryos: inside an embryo, specialised cells are reprogrammed to form the sperm or egg cells for the next generation. Professor Wolf Reik[6] and his team at The Babraham Institute performed the first large-scale study of this reprogramming. The results of their work may lead to the ability to generate stem cells easily from specialised adult cells, which has huge medical applications.

The Bioinformatics Group played a central role in interpreting the data from this study, by developing the software needed to extract the correct information from the data, visualise patterns in the data, and statistically analyse it.