

What is the National Grid Service?

The National Grid Service (NGS) aims to provide coherent electronic access for UK researchers to all computational and data based resources and facilities required to carry out their research, independent of resource or researcher location.

You can find further information about the NGS on its website at www.ngs.ac.uk. The website contains a wide range of documentation including technical details, software listings, user case studies and online tutorials for self-guided learning.

Keep in touch with the NGS

If you would like to be kept up to date with news from the NGS then join our mailing list to receive fortnightly news updates including events and training opportunities.

www.jiscmail.ac.uk/lists/NGS-NEWS.html

If you are a user of NGS resources then join our status mailing list to be kept up to date with service news and updates.

<http://www.jiscmail.ac.uk/lists/NGS-STATUS.html>

The NGS produces a quarterly newsletter containing a large variety of news about the NGS

including user case studies, NGS site news, application updates and conference reports. The latest edition of NGS News can be found on our website in the Outreach section or join our mailing list to receive an announcement when the latest edition is released.

Contact the NGS

If you have any queries regarding the NGS or if you would like more information, then contact our helpdesk:

NGS Support Centre
Email: support@grid-support.ac.uk
Tel: +44 (0) 1235 446 822

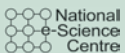
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Dr Blanca Rodriguez
University of Oxford

Understanding electrical defibrillation of the heart



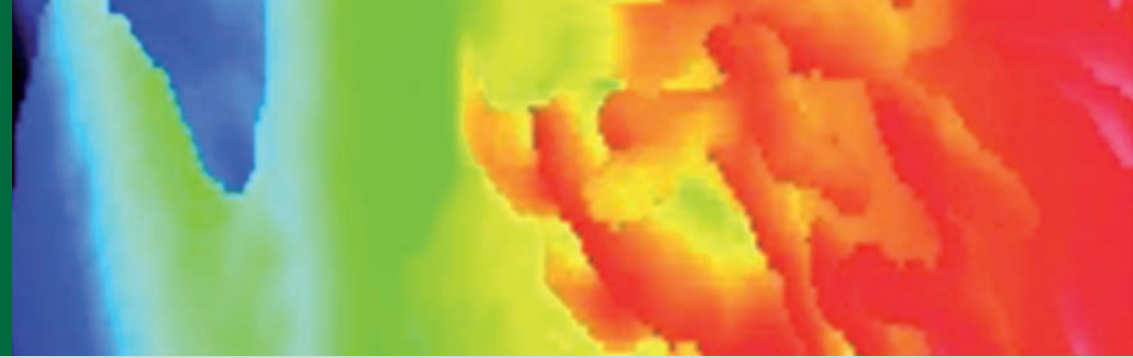
www.ngs.ac.uk



Name: **Dr Blanca Rodriguez**

Institution: University of Oxford

Research: **Understanding electrical defibrillation of the heart**



Dr Blanca Rodriguez has been using the NGS since it first entered production in 2004, as part of the Integrative Biology Project (www.integrativebiology.ac.uk/).

Along with colleagues from the Computational Biology Group at the University of Oxford, Dr Rodriguez uses computer simulations to study the mechanisms of defibrillation in the heart. By simulating the electrical activity in the ventricles and the application of an electrical shock to cardiac tissue, they are able to study how the heart tissue reacts to the application of an electrical shock.

When a heart is in fibrillation, lots of small irregular waves are propagating through the myocardium, and so the heart is unable to beat properly which in turn means blood cannot get round the body. The most effective treatment for ventricular fibrillation is defibrillation, or the application of an electrical shock in order to

stop fibrillatory activity of the heart completely so that normal contractions can begin again.

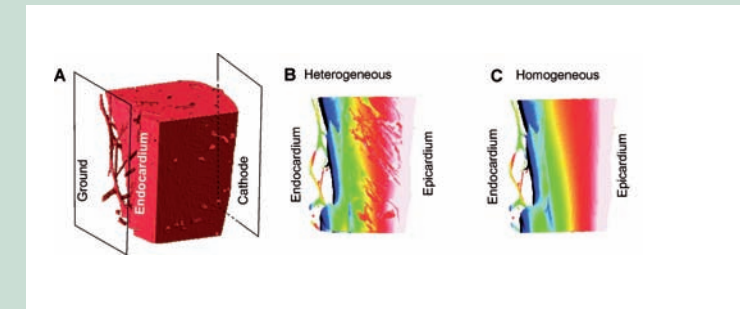
Defibrillation may be well used in hospitals now, but the mechanisms behind it are still not fully understood. In order to understand exactly how defibrillation works, Dr Rodriguez and PhD students within the Integrative Biology project are simulating the application of electric shocks to both healthy and diseased hearts. Many sequential simulations are run with parameter sweeps of variables such as the shock strength and timing of application. To obtain 250ms of animated data, 28 hours of processing time must be used for each parameter. With the use of the NGS, Dr Rodriguez has been able to run hundreds of sequential simulations on many CPUs, something which she feels she would have been unable to achieve without the NGS. "Using the NGS does not give time improvements when you are using sequential code, but it

does give definite performance improvements." says Dr Rodriguez. "Once you get started, using the NGS is very easy to use."

Further information

Integrative Biology Project
www.integrativebiology.ac.uk

Computational Biology Group,
University of Oxford
<http://web.comlab.ox.ac.uk/oucl/research/areas/biocomp>



Simulation of the outer (epicardium) and inner (endocardium) layers of the heart.