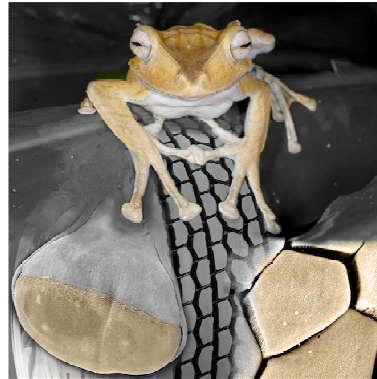


IMAGES ON THE CLYDE WALKWAY

*A partnership between
the University of Glasgow
and Glasgow Science Centre*

AUDIO RECORDING SCRIPT

Jon Barnes



Introduce yourself

I'm Dr Jon Barnes, leader of the tree frog adhesion research group at the University of Glasgow's Centre for Cell Engineering.

What can the visitor see?

At the top of the image, you can see a tree frog – this one comes from Borneo where we do some of our research. Note that each toe ends in an expanded pad, which the frogs use to adhere to smooth surfaces. At the lower left is a low power electron microscope image of a pad, the structure of which is shown at the lower right. As you can see, the pad is made up of cells, separated by channels, reminiscent of the tread pattern of a car tyre. Since frogs can hang on to overhanging smooth surfaces, maybe some of their 'tricks' can be transferred to the tyre industry to make better wet weather tyres.

How did you take this image?

The image was created by Dr Thomas Endlein, a scientist in my group who also happens to be a first class wildlife photographer.

Where and when was it taken?

The frog was photographed in the rain forests of Borneo last year, where we go to study the adhesive mechanisms of torrent frogs, which are very good at clambering over rocks in and around waterfalls.

How do you study this?

We study frog adhesion at all levels, from behaviour to biomechanics, from a variety of microscopical methods that examine the structure of toe pads, to engineering techniques that measure the physical properties – such as hardness and elasticity – of the toe pads. Our German collaborators fabricate replicas of the toe pads and test their properties.

Why do people study this?

In part this is an interesting biological problem, but mostly we study it for its biomimetic potential. Biomimetics means copying or being inspired by nature to develop some new device. In this case, there could be many applications for new smart adhesives that stick under wet and flooded conditions.

Why did you end up doing this research?

Serendipity – a bright student, Gavin Hanna, wished to do an undergraduate project with me, but didn't want to study the neurobiology of simple animals, my research field at the time. Our discussions ended up with a decision to try out a new field, hardly studied by anyone at that time. It has blossomed, and the study of the adhesive mechanisms of climbing animals and their potential for developing new ways of temporary attachment is now an active field worldwide. Spiderman may yet become a reality, though perhaps utilising the adhesive mechanisms of geckos rather than tree frogs.