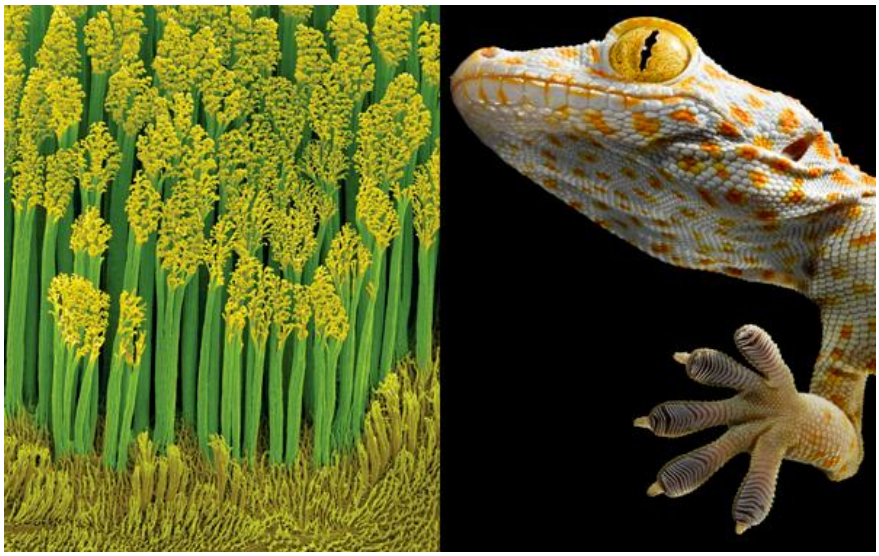
Gecko Feet Information for the Website

What's going on with Norma's feet?

All giant geckos have expanded toe pads that allow them to climb vertically on smooth surfaces. This allows geckos to adhere to just about any surface, wet or dry, smooth or rough, hard or soft. The adhesive that Norma has is unique in that it is self-cleaning during repeated use.

Gecko adhesion can be mechanically switched on and off. Sliding against a surface uncurls the toes to engage the adhesive. By relaxing sliding tension, the adhesive can be released. The toes of the gecko have a special adaptation that allows them to adhere to most surfaces without the use of liquids or surface tension.

Every square millimeter of a gecko's footpad contains about 14,000 hair-like setae. Each seta has a diameter of 5 micrometers. Human hair varies from 18 to 180 micrometers, so a human hair could hold between 3 and 36 setae. Each seta is in turn tipped with between 100 and 1,000 spatulae. Each spatula is 0.2 micrometer long (one five-millionth of a meter), or just below the wavelength of visible light.



Recent studies of the spatula tipped setae on gecko footpads demonstrate that the attractive forces that hold geckos to surfaces by very small forces between the finely divided setae and the surfaces themselves.

More information about geckos and their amazing feet:

- BBC's Gecko's Amazing Sticky Feet http://news.bbc.co.uk/2/hi/781611.stm
- Mimicking Gecko Feet: Dry Adhesive Based On Carbon Nanotubes Gets Stronger http://www.sciencedaily.com/releases/2008/10/081009143704.htm
- Gecko Feet http://sciencenetlinks.com/science-news/science-updates/gecko-feet/
- Nanotubes Mimicking Gecko Feet http://www.nisenet.org/scientific-images/nanotubes_mimicking_gecko_feet