

The Answers Lie Within our Hands



Figure 1. Josephine Waring, *The Answers Lie Within Our Hands* (concept drawing), 2017, graphite on paper.

The work in this exhibition was made in conjunction with Padmini Parthasarathy, from the Department of Biochemistry. She is currently researching the SLC2A9 gene.

The SLC2A9 gene provides instructions for making a protein called glucose transporter 9 (GLUT9). The GLUT9 protein helps transport a substance called uric acid. Uric acid is a by-product of certain normal chemical reactions in the body. In the bloodstream it acts as an antioxidant, protecting cells from the damaging effects of unstable molecules called free radicals. However, having too much uric acid in the body is toxic, so excess uric acid is removed from the body in urine.¹

SLC2A9 gene variants have been associated with urinary uric acid concentration, but more research is needed into the how this gene is expressed and environmental factors such as diet in disorders associated with excess uric acid in the bloodstream.² Padmini's research focuses on the damage and deformity caused by the deposition of uric acid crystals in the joints at the extremities of our body - the feet and hands.

...[while] the role of the *SLC2A9* gene in gout may be unclear, it is known that a combination of lifestyle, genetic, and environmental factors play a part in determining the risk of this complex disorder.³

Uric crystals look like shards of glass. They deposit in the joints and damage the joint. On an X-ray, they look like a cloud-like density where the joint should be.⁴ This is different to what arthritis looks like on X-rays, where you can see where the distorted growth is in the bone at the joint.

Hands are probably our most important tool, and we describe them in many different ways: large, strong, capable, warm, cold, limp, small, slender, elegant, lady-like, delicate, work-worn, arthritic. But there is another word - GOUTY: the hot, swollen, extremely painful and deformed joints, unable to be used as a result of uric acid crystal deposition.



Figure 2. Josephine Waring, *The Answers Lie Within Our Hands*, 2017, stoneware clay with an iron stain and fired to cone 10. One hand cradles cut-out shapes, representing the sharp uric acid crystals, whilst the other lies on a map of the Pacific Ocean.

Josephine Waring is a Ceramic Diploma student at the Dunedin School of Art, Otago Polytechnic.

1. "SLC2A9 Gene: Solute Carrier Family 2 Member 9." *US National Library of Medicine*, <https://ghr.nlm.nih.gov/gene/SLC2A9#conditions> (accessed 20 August 2018).
2. Erin Ware, et al., "SLC2A9 Genotype is Associated with SLC2A9 Gene Expression and Urinary Uric Acid Concentration." *PLoS*, Vol. 10 (2015), <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0128593>.
3. "SLC2A9 Gene: Solute Carrier Family 2 Member 9." *US National Library of Medicine*, <https://ghr.nlm.nih.gov/gene/SLC2A9#conditions> (accessed 20 August 2018).
4. "Gout- Hand." *Learning Radiology*, <http://learningradiology.com/archives2010/COW%20423-Gout%20hand/goutcorrect.htm>. See image of deposition of sodium urate monohydrate crystals in synovial membranes, articular cartilage, ligaments, bursae leading to destruction of cartilage.