



Dr Chrissy Hammond
MBiochem(Oxon.), PhD(Lond.)

Senior Research Fellow

Area of research

Regulation of cartilage and bone homeostasis in development and in disease

Office C24a
Biomedical Sciences Building,
University Walk, Bristol BS8 1TD
([See a map](#))

+44 (0) 117 331 11417
chrissy.hammond@bristol.ac.uk

Summary

My research focuses on the regulation of cartilage and bone homeostasis in development and in disease, particularly osteoarthritis. I use the zebrafish as a model because it combines excellent genetics with beautiful imaging possibilities, which allow us to study the development of the skeletal system dynamically *in vivo*.

We have a number of projects running, including pilot experiments on the affects of gravity on the zebrafish skeletal system (with experiments to be run in hypergravity at the European Space Centre and in microgravity on the International Space Station.

We are characterising zebrafish mutants that we have generated carrying mutations to genes known to increase human susceptibility to osteoarthritis.

We are characterising zebrafish models of Stickler syndrome

Activities / Findings

- Two populations of osteoblasts (bone forming cells) respond to different levels of Hedgehog signalling [Read more >](#)

Memberships

Organisations

[School of Physiology, Pharmacology & Neuroscience](#)

Research Areas

- [Regulation of cartilage and bone homeostasis in development and in disease](#)

Selected publications

- E, [VE, AM, [VV, HJ, [VK, Styrkarsdottir, U, Zhu, Y, Meulenbelt, I, Lories, R, Karassa, F, Tylzanowski, P, Bos, S, Consortium, TA, Akune, , Arden, N, Carr, A, Chapman, K, Cupples, L, Dai, J, Deloukas, P, Doherty, M, Doherty, S, Engstrom, G, Gonzalez, A, Halldorsson, B, Hammond, C, Hart, D, Helgadottir, H,

Hofman, A, Ikegawa, S, Ingvarsson, T, Jiang, Q, Jonsson, H, Kaprio, J, Kawaguchi, H, Kisand, K, Kloppenburg, M, Kujala, U, Lohmander, L, Loughlin, J, Luyten, F & others 2011, '[Meta-analysis of genome-wide association studies confirms a susceptibility locus for knee osteoarthritis on chromosome 7q22](#)'. *Annals of the Rheumatic Diseases*, vol 70 (2), pp. 349 - 355

- Spoorendonk, K, Hammond, C, Huitema, L, Vanoevelen, J & Schulte-merker, S, 2010, '[Zebrafish as a unique model system in bone research: the power of genetics and in vivo imaging](#)'. *Journal of Applied Ichthyology*, vol 26., pp. 219 - 224

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Recent publications

- Kague, E, Lawrence, E, Cross, S, Martin, L, Hammond, C, Hinitz, Y & Hughes, S, 2019, '[Scleraxis genes are required for normal musculoskeletal development and for rib growth and mineralization in zebrafish](#)'. *FASEB Journal*.
- Bergen, D, Kague, E & Hammond, C, 2019, '[Zebrafish as an emerging model for osteoporosis: a primary testing platform for screening new osteo-active compounds](#)'. *Frontiers in Endocrinology*, vol 10.
- Lawrence, E, Kague, E, Aggleton, J, Harniman, R, Roddy, K & Hammond, C, 2018, '[The mechanical impact of loss of col11a2; mutant zebrafish show changes to joint shape and function which leads to early onset osteoarthritis](#)'. *Philosophical Transactions B: Biological Sciences*, vol 373.
- Kague, E, Witten, PE, Soenens, M, Campos, CL, Lubiana, T, Fisher, S, Hammond, C, Brown, KR, Passos-Bueno, MR & Huyseune, A, 2018, '[Zebrafish sp7 mutants show tooth cycling independent of attachment, eruption and poor differentiation of teeth](#)'. *Developmental Biology*, vol 435., pp. 176-184
- Stevenson, NL, Bergen, DJ, Xu, A, Wyatt, E, Henry, F, McCaughey, J, Vuolo, L, Hammond, CL & Stephens, DJ, 2018, '[Regulator of calcineurin-2 is a centriolar protein with a role in cilia length control](#)'. *Journal of Cell Science*, vol 131.
- Brunt, LH, Begg, K, Kague, E, Cross, S & Hammond, CL, 2017, '[Wnt signalling controls the response to mechanical loading during zebrafish joint development](#)'. *Development (Cambridge)*, vol 144., pp. 2798-2809
- Stevenson, NL, Bergen, DJ, Skinner, RE, Kague, E, Martin-Silverstone, E, Brown, KAR, Hammond, CL & Stephens, DJ, 2017, '[Giantin-knockout models reveal a feedback loop between Golgi function and glycosyltransferase expression](#)'. *Journal of Cell Science*, vol 130., pp. 4132-4143
- Stephens, D, Stevenson, N, Bergen, D & Hammond, CL, 2017, '[The Golgi matrix protein giantin is required for normal cilia function in zebrafish](#)'. *Biology Open*, vol 6., pp. 1180-1189

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