



freedom
of form
foundation

Action Update

The Intrigue of Integument

FFF Team embarks on review of the science of fur, scales and feathers

by [Athamanatha Kitsune](#) on Friday 4th December, 2020

It's at the core of the furry fandom, it covers every complex living creature. Integument refers to fur, hair, scales, feathers and anything else that comprises the outermost layers adorning a complex living creature. The Freedom of Form Foundation has begun a major review of the existing literature and studies into the structures, developmental processes, growth and properties of these protective and decorative layers, and how they are genetically encoded.

This comprehensive review will allow us to lay the groundwork for better alterations of the integument of patients seeking to do so for morphological freedom. To give a taste, the proposal document for this project alone was 32 pages long. There's a lot to cover.

New website!

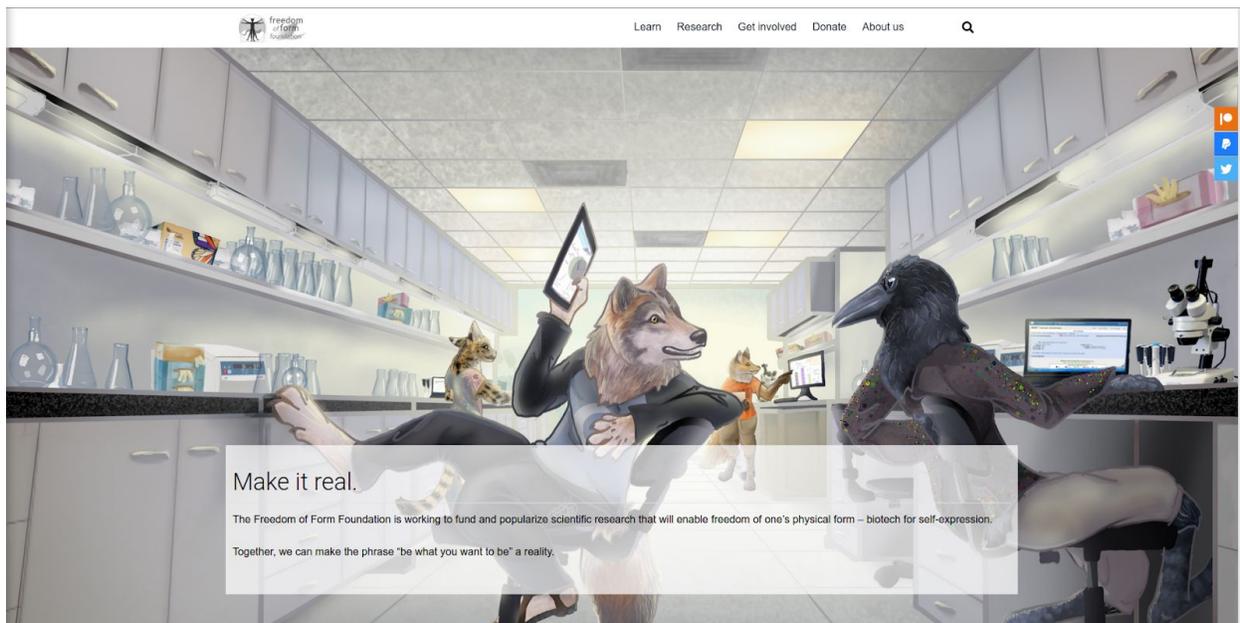
by [Athamanatha Kitsune](#) on Friday 4th December 2020

Our website has been upgraded and improved with a stunning new 'hero' image and layout. If you spot anything you think can improve on it, please don't hesitate to get in touch with your suggestions.

The image shows some members of our team as their preferred forms in a lab, busy researching... perhaps including the safety limits of leaning on an office chair. It is our dream that you can be any form you like, and we will support even the smallest of changes or decisions not to change.

Updated pages and content, responsiveness to mobile browsers and much more await, so check it out!

[CHECK OUT OUR WEBSITE](#)



New volunteer!

by **Cam Cam** on Monday 7th December 2020



Hello all! My name is Cam Cam, and I am proud to be the FFF's newest formalized volunteer! I am currently a full-time undergraduate student at UC Berkeley, and am majoring in chemical biology. I love listening to others talk about science, playing the trombone, and all things furred, scaled, and feathered! Science has always been a passion of mine, especially in the realms of biology and chemistry.

I always thought that I would want to get into research, but I could never seem to find a subject that I would want to pursue in the long run. When I discovered the FFF earlier this year, I immediately felt a connection to the goal of morphological freedom, and knew that I wanted to put myself towards that goal through research.

I am now a part of the Integument Review Paper team, and although I am a bit of a greenhorn when it comes to research, I am having a fantastic time working with and learning from the talented scientists of this foundation. I look forward to what the future has in store for the FFF and our goals, and I am so glad to be a part of it all! Thank you so much for this opportunity!

[Would you like to volunteer too?](#)
[Check out our open positions!](#)

Mouse Organs

by **SiberDrac Terrian** on Monday 7th December 2020

“Nature is nowhere accustomed more openly to display her secret mysteries than in cases where she shows traces of her workings apart from the beaten path.” -*William Harvey*, English physician

The skeleton is our most enduring tool by which to compare the physical shapes of vertebrates and the relationships among them. Through contrast, we can uncover the shared shapes and mechanisms for patterning the final forms of ourselves, other animals, and our common ancestors. Our limbs in particular reveal the vast breadth of geometries that can be achieved by tweaking the components of a relatively simple molecular toolbox.

Fibrodysplasia ossificans progressiva (FOP) is a rare and devastating genetic condition in which bone progressively forms throughout the body, most often in response to injury. In humans, it can be diagnosed even before birth by identifying short, oddly angled big toes. That is where my fascination with the disease began. My dissertation work focused on first, what the problem with the toes really is; second, how it arises; and third, what it meant for the rest of the body. To compress three papers into a sentence: first, the problem was with the formation of the skeletal joints in the toe [Towler et al 2020, *Front. Cell Dev. Biol.*]; second, it arose by slightly altering one component of that molecular toolbox for making skeletons [Towler et al 2020, *Dev. Biol.*]; and third, it uncovered a host of joint-related issues that had been underreported in FOP patients [Towler et al 2019, *Bone*]. Together, these provide a much more satisfying link between the disease's disastrous effects on the body and the comparatively benign effect on the big toe.

What does this have to do with freedom of form? My interest in the project stemmed from some of the questions that need answering in order to customize myriad shapes: What is the simplest toolbox responsible for those shapes and how do we use it? My work adds to the growing understanding of what one of those natural tools called “BMP” does to sculpt the embryonic skeleton. In this case, allowing a specific protein to be just slightly too active impairs the body’s ability to form healthy joints and changes the arrangement of certain bones. With work, one can imagine designing and/or informing software to predict adult structures based on changes in the embryo using findings from studies like this one. Of course, FFF isn’t growing new people. However, as our timeline approaches that of science fiction, one of our routes might be to grow replacement limbs just as we grow replacement livers. To do so, we’ll need to carefully use tools out of that toolbox and know exactly what we’re doing. One of the best ways to learn is to pay rapt attention to nature, the original artisan, and infer what each tool does from when its use goes awry.

The new paper will be published very soon and links will be announced when available.

Made Monthly

by [Athamanatha Kitsune](#) on Friday 4th
December 2020

This newsletter is made for you monthly, not weekly - apologies for any confusion.

We’re on LinkedIn, Youtube, Soundcloud, Google Podcasts, Breaker, RadioPublic, Spotify, Anchor, Twitter, Telegram and Discord!

Why not check out our awesome perks on Patreon or if you prefer, drop us something nice via Paypal. You can also add us to your Amazon Smile orders in the USA!

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