



MAD(AM) SCIENTIST



RÉSEAU DE RECHERCHE EN SANTÉ
BUCCODENTAIRE ET OSSEUSE

FOREWORD

Science is intimidating for the average person. Scientific studies are all too often explained in a clinical manner, the subject matter is advanced and complicated to understand... Consequently, it is easy to believe, wrongly, that researchers are disconnected from the general public. Their projects, therefore, remain generally unrecognized and unappreciated, while false information flourishes and becomes more attractive.

Research into oral and bone health is particularly unpopular. There is a general tendency toward denial: this field of expertise elicits aversion, since it is too often associated with pain (fractures) or even disgust (oral infections, oral cancer, etc.).

This collection has the mission of reversing this tendency by informing you of major advances in the field. We want to show you what health research is and share our passion with you. Research is one of the drivers of humanity, but researchers must better communicate and explain how their work contributes to the welfare of individuals, the environment, and society.

In order to highlight the research and its members in an original way, the Network for Oral and Bone Health Research (RSBO for "Réseau de recherche en santé buccodentaire et osseuse") retained two artists in residence, Daniel Ha and Martin PM. For more than a year, Daniel and Martin met with our researchers across Quebec and visited their labs. In the following pages, you can read and enjoy their comics, and thereby discover along with them, the extraordinary work being done by our researchers.

We hope that these pages will inspire you and allow you to see the scientific research in the field of oral and bone health with new eyes. Perhaps it will elicit among the younger crowd the desire to study the sciences and, who knows, become researchers themselves?

RSBO Art and Science Committee

Dr. Christophe Bedos, RSBO Director

Dr. Argerie Tsimicalis, Researcher and RSBO Member

Dr. Marta Cerruti, Researcher and RSBO Member

Dr. Andrée Lessard, RSBO Manager

Martin Patenaude-Monette, RSBO Artist in Residence

Daniel Ha, RSBO Artist in Residence

WHAT IS IT?

WHAT IS THE RSBO?

For more than 25 years, the Network for Oral and Bone Health Research (RSBO for “Réseau de recherche en santé buccodentaire et osseuse”) tirelessly supports Quebec researchers and their students in the pursuit of excellence in fundamental, clinical, and epidemiological research. The Network numbers more than 100 researchers and over 300 students predominantly from McGill University, Université de Montréal and Laval University, as well as their affiliated hospitals (notably CHU Sainte-Justine, Shriners Hospitals for Children-Canada, Montreal General Hospital, Jewish General Hospital and Montreal Sacred Heart Hospital).

The RSBO network is funded primarily by the “Fonds de recherche du Québec – Santé” (FRQS). It also relies on partnerships with associates from different backgrounds, notably professional organizations in the field of oral and bone health as well as associations which represent the most underprivileged people in our society. This is how the RSBO network brings together the stakeholders in our social fabric – scientific community, clinicians, populations and users of healthcare services, as well as administrators, decision makers and industries – with an eye toward producing knowledge on health and oral and bone diseases, but also to take this knowledge and apply it.

The actions of the RSBO network fall within the national strategies for promoting health as well as those set forth by the World Health Organization. The Network aims to promote the health and welfare of the Quebec population, to reduce inequalities in healthcare, but also to contribute to the economic and social vitality of Quebec. Actions taken by the RSBO network can, in fact, stimulate the retention or return to employment of more vulnerable people, develop highly qualified personnel, generate the development of new technologies, or encourage scientific entrepreneurship and the production of patents.

Transmitting knowledge is one of the major goals of the RSBO network. This is why we created the Art and Science Committee, which promotes scientific research and health of the Quebec society through the arts. The RSBO network considers that sciences and the arts, far from being antithetical, can in fact mutually feed each other, combine, and ultimately, benefit the entirety of the population.

ART & SCIENCE

This comic collection is a creative and original way to raise awareness in our fellow citizens about research done here, especially on a subject like oral and bone health, which can be quite off-putting for the uninitiated. And yet, the research we are doing is fundamental for all of us.

The idea of doing a collection of comics is exactly right coming from the RSBO Art and Science Committee, and a great approach to demystifying everything that happens in our mouth, from the effect of sugar on our teeth to oral ecology, as well as 3D technology to foster stronger bones, and other activities which take place between our nose and our chin...

Due to its excellence in research, the Network is supported by the “Fonds de recherche du Québec – Santé” (FRQS). It seems so very pertinent and important to me that the general public better understand the research being done since, in the end, it is they who benefit from it, even if they don't realize it.

At a more basic level, it is important to raise awareness concerning science and research in the general population: the methods, approaches, questions, and uncertainly, but also the discoveries, results, and accomplishments! It is important to increase the number of opportunities to present science to the population, young or old, so that scientific expertise becomes the first instinctive source we turn to when we ask questions on any particular subject. Calling on art is definitely a good way to stimulate curiosity.

I commend the Network for its initiative in raising awareness for its expertise and projects, and perhaps generating interest among the new generations of students who are wondering about their future. Who knows? Perhaps, despite a little bit of apprehension, this comic collection might help you better appreciate your next visit to the dentist!

*Rémi Quirion,
Chief Scientist of Quebec*

MAD(AM) SCIENTIST



MARTA CERRUTI, PH. D.

Assistant Professor, Department of Engineering, McGill University

In an obscure lab at McGill University, a secret weapon is being developed in order to decalcify our arteries. Our graphic artist discovered, and is exclusively revealing, Dr. Cerruti's groundbreaking plans for conquering the world!

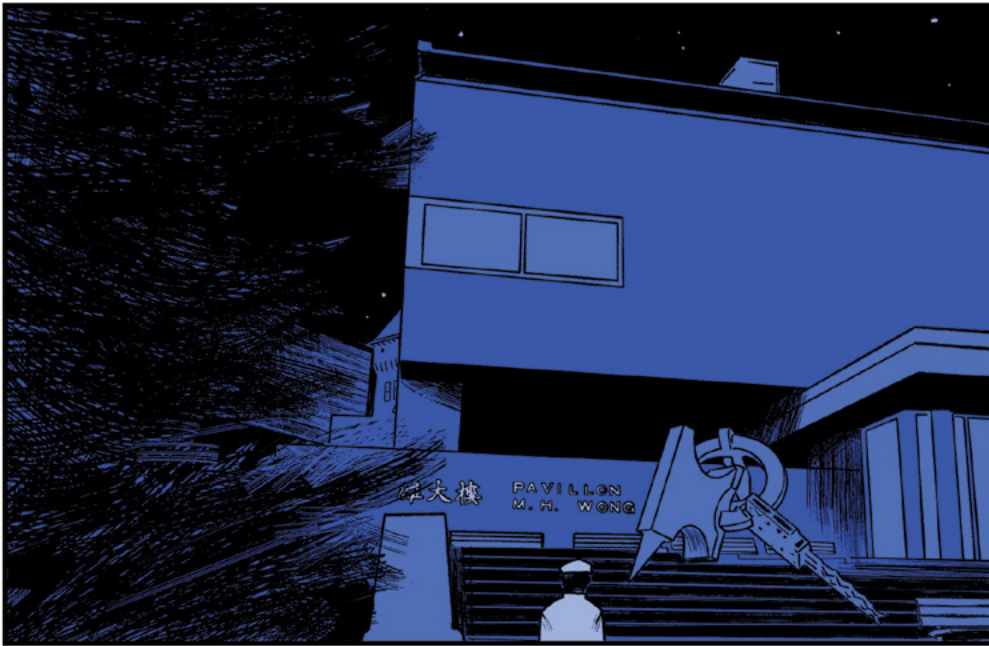


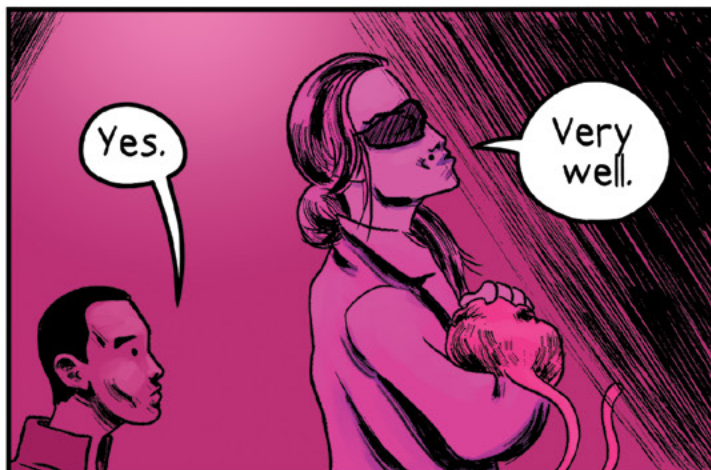
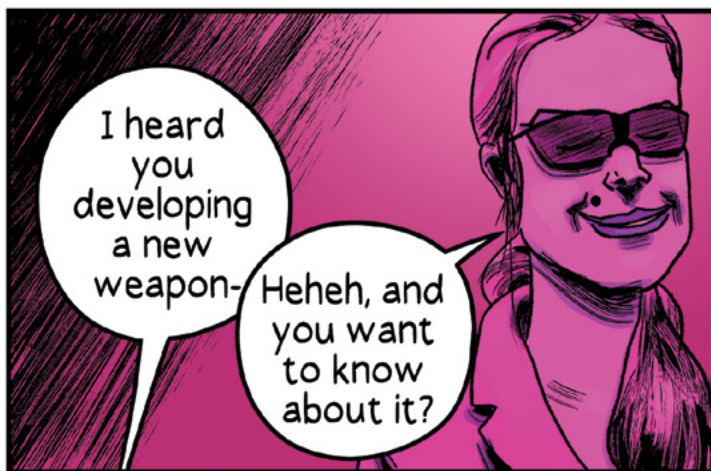
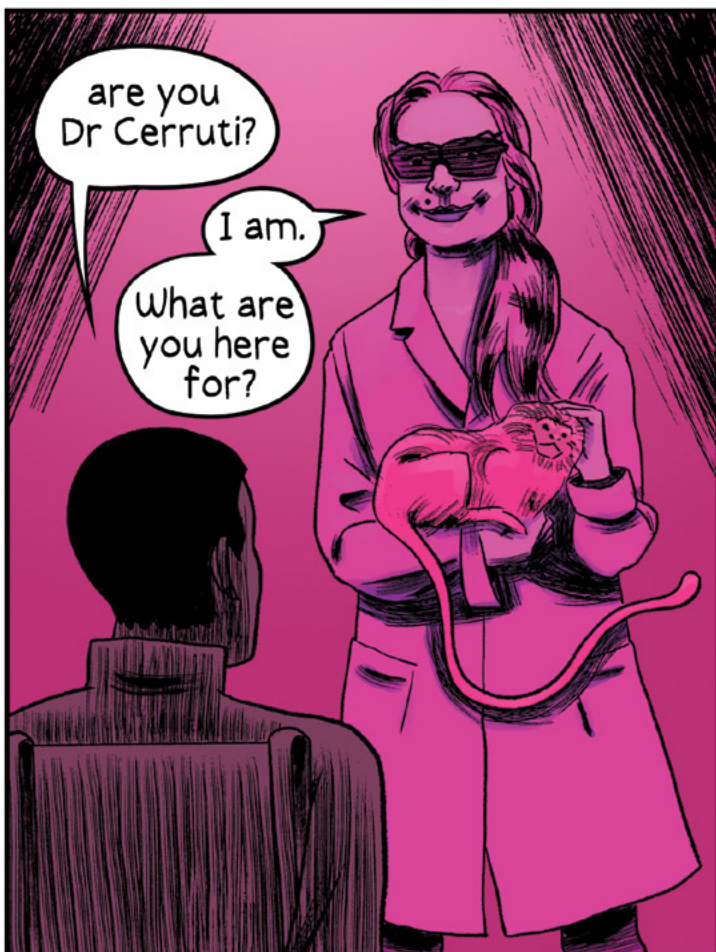
DANIEL HA

Daniel Ha, also known as Daniel Vinh Ha Thé or Hà Thế Vinh, turns out to be a type of hermit who is ordinarily found huddled in his cavern. In the wild, he can sometimes be seen in a metro car. He is distinguished by the quality of being a rare Homo sapiens who prefers the pages of a real book (a comic book in his case) to the screen of a cell phone. In order to earn his daily bread, he palpates tongues, uses a powerful blue laser capable of transforming viscous matter into a solid block, and accepts being splashed with saliva and blood on his face, neck and forearms. From time to time, he draws, but receives no financial benefit from it.

www.dvhstudios.com

[instagram.com/dvhcomics/](https://www.instagram.com/dvhcomics/)





In my Biointerface Lab, we are working on the AD.

Some people develop calcifications (made of calcium and phosphate) in their blood.

can lead to heart disease

arteries

calcifications

There is no cure for this.

For some we give them drugs with many side effects called phosphate chelators or binders.

medication

calcifications

calcification

weakened bone

DJ DUSTA HIP

If there is less phosphate in your blood, there will be less calcifications. However, having less phosphate will affect your bones.

To fight the calcifications, we have 3 methods of attack:

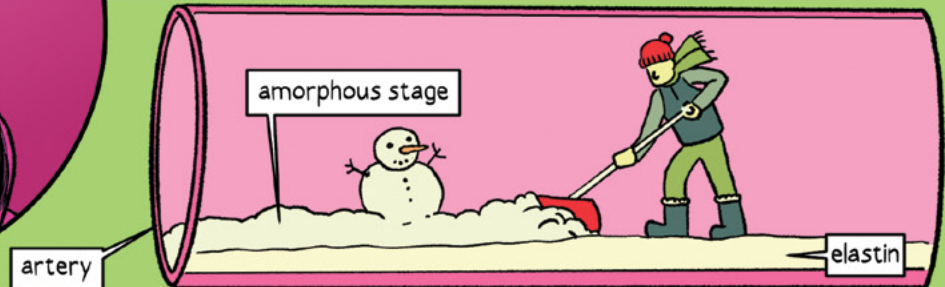
1-The minerals (calcium and phosphate) deposit on a substrate called elastin. We can find the side they deposit on and block that site.

minerals

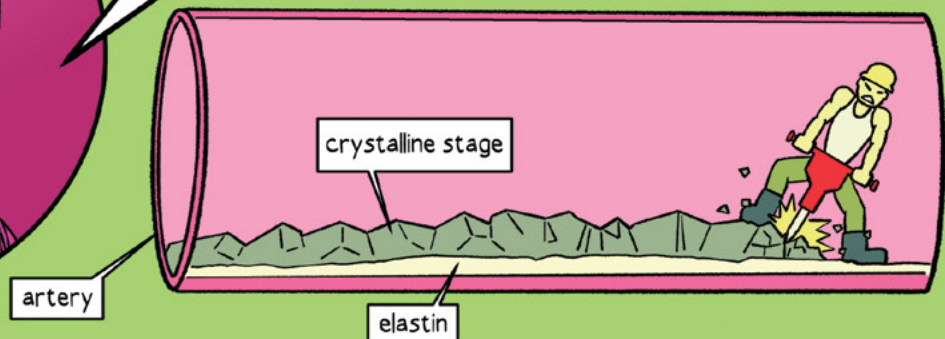
elastin

elastin

2-When minerals start forming, they are amorphous (not very organized) and eventually their structure change and become crystalline (at that point, they are basically the same mineral we find in bone).



We want to dissolve the minerals at the amorphous stage, because at the crystalline stage, they become very hard to remove.

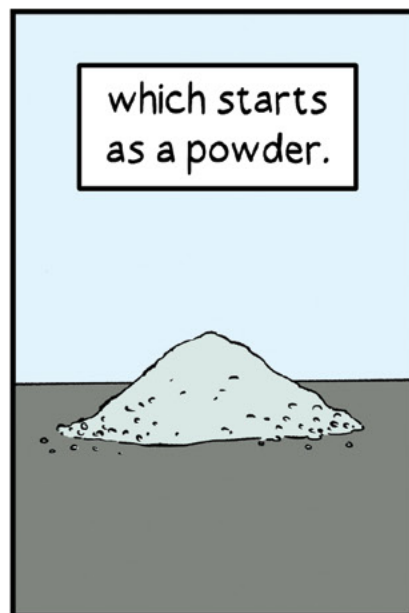


3-We can find the natural proteins in our bodies that inhibit this calcifications.





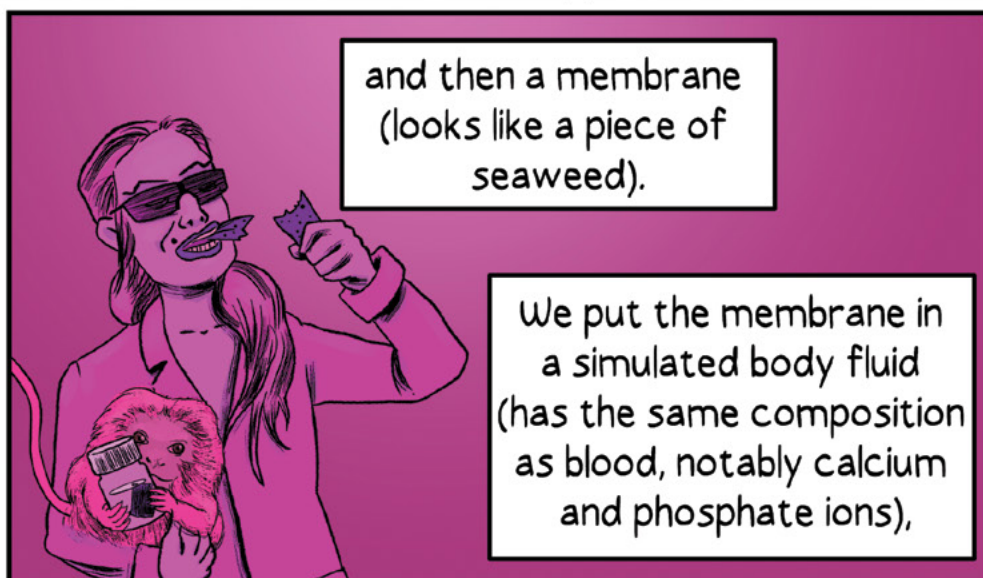
Thus, here, in my Biointerface Lab,
we take elastin (a protein),



which starts
as a powder.

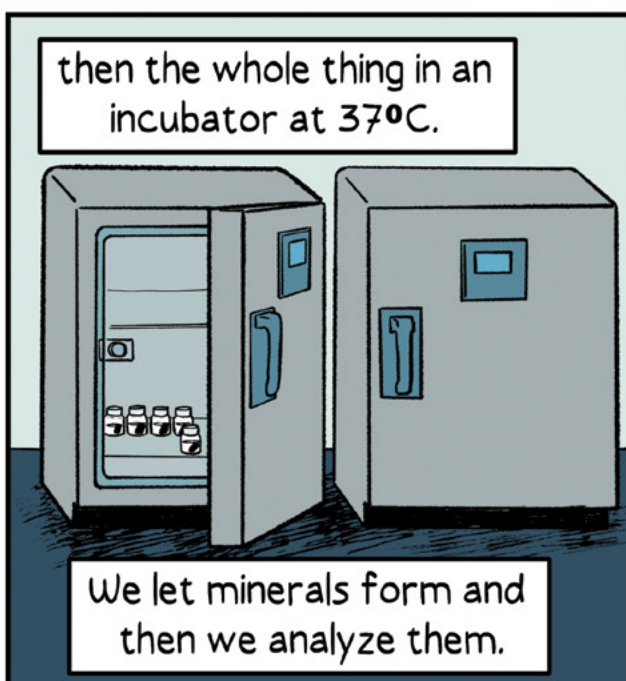


We turn it into
a solution



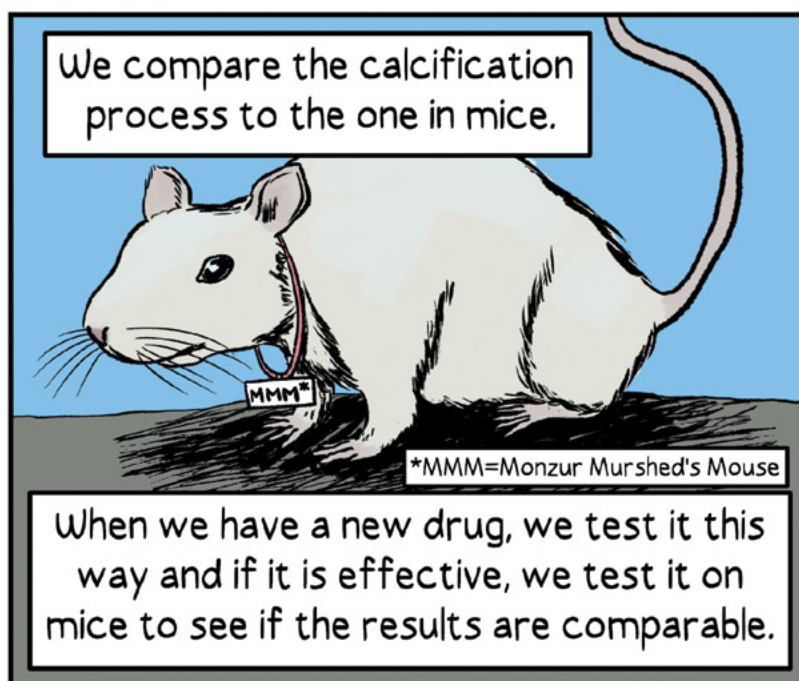
and then a membrane
(looks like a piece of
seaweed).

We put the membrane in
a simulated body fluid
(has the same composition
as blood, notably calcium
and phosphate ions),



then the whole thing in an
incubator at 37°C.

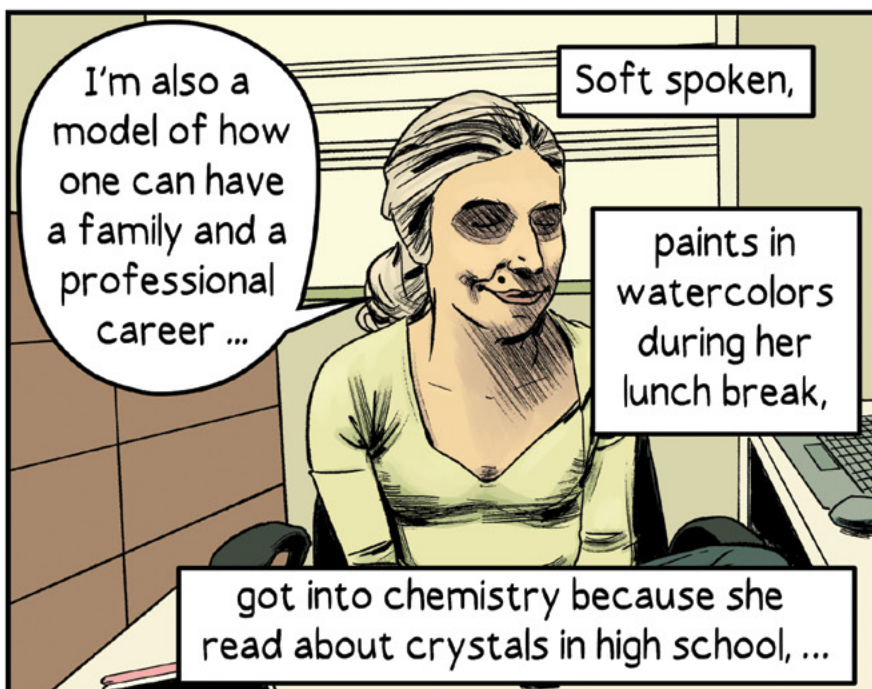
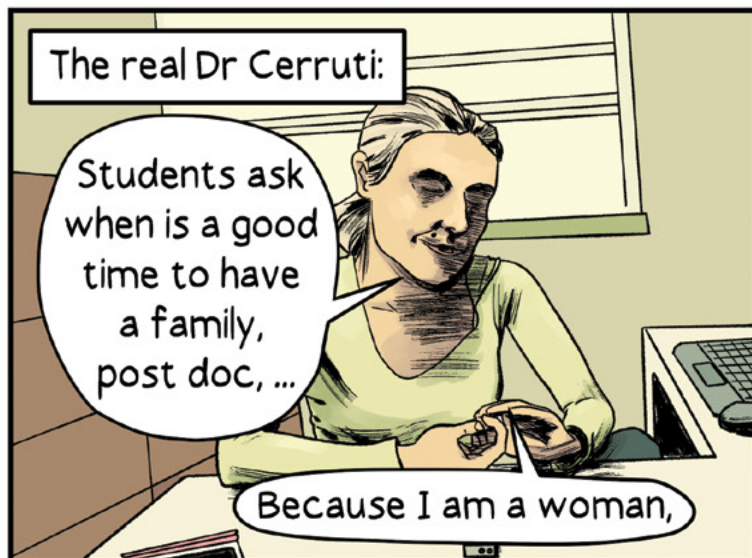
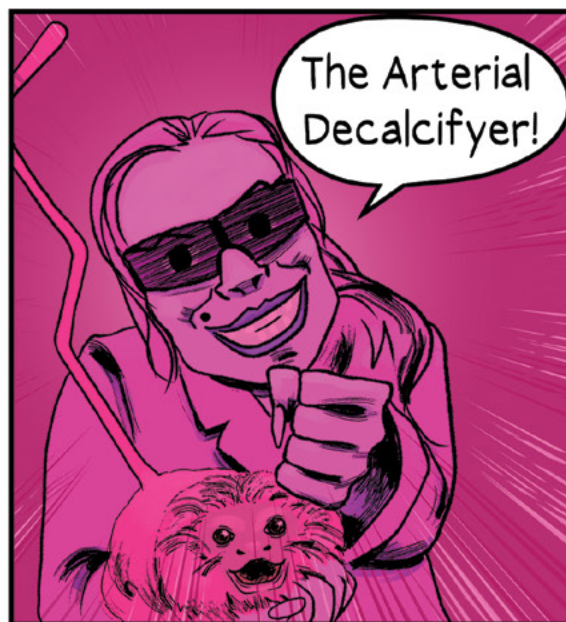
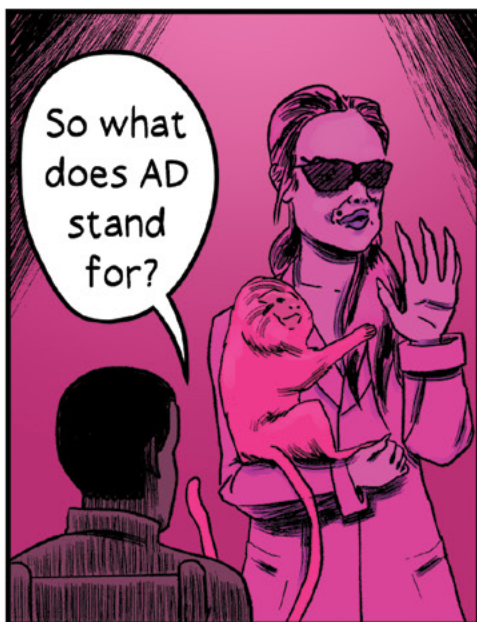
We let minerals form and
then we analyze them.



We compare the calcification
process to the one in mice.

*MMM=Monzur Murshed's Mouse

When we have a new drug, we test it this
way and if it is effective, we test it on
mice to see if the results are comparable.



To find out more about Dr Cerruti and her work, you can visit:

www.biointerfacelab.mcgill.ca

rsbo
COMICS

no comic book geeks were hurt during the creation of this comic

ACKNOWLEDGEMENTS

The RSBO network thanks its partners

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des dentistes
du Québec

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 UNIVERSITÉ
LAVAL

 McGill

Faculty of Dentistry Faculté
de médecine dentaire

Université 
de Montréal

Daniel Ha

I would like to thank the RSBO network (especially CB and AL) for having given me this opportunity. Without the talent, know-how, and experience of my colleague Martin, I am convinced this book would not exist. Diego, Aya and JS gave me their precious time and constructive advice. My parents, my sister and my brother have delivered groceries and meals during lockdown (OK, they did so during normal times, too). Thanks to M. Hay for their participation. Thanks to CB (a different one) for their collaboration, and for having made us look good. And finally, thank you to MGT, my haven.

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