St. Paul's Hospital and Its Animal Research Labs

By Renea Mohammed

I've stood outside, many a time, as one of a group of people holding a placard and demonstrating against the plan to include animal research labs in Vancouver's new St. Paul's Hospital and Health Campus. The new complex is slated to have two separate research towers, 800,000 square feet, that will include animal laboratories. Some people walk by and show no interest as we demonstrate. A heartening number of people stop and talk about the issues and are often supportive – as evidenced in the 36,344 signatures that the Animal Defence and Anti-Vivisection Society of BC has collected on its petition not to have animal labs included in the new hospital complex at the time of this writing. On the other side of things, there are people who pass by while delivering a quick quip like "Oh, so they should test on humans should they? Let's see how long you would live." This kind of comment is made as the person strolls briskly along, without pausing, and there is really no time to respond in the thirty seconds I am given. I'd like to respond now.

Drs. Ray Greek and Lisa Kramer are among the researchers who have said that animal modeling is a poor methodology when investigating human responses to drugs and disease. It isn't predictive of human responses and should therefore be abandoned in favour of research and testing that is "human-based". I'd like to unpack this idea a bit, starting with the reality that animal models are not predictive of human responses to treatments.

In 2004, the FDA reported that over 92% of drugs that succeed in animal testing fail in human clinical tests. According to Dr. Aysha Akhtar, more recent analysis shows the rate of failure to be at the 96% level. Animal physiology is simply not the same as human physiology. On Aug. 29, 2022, the Canadian government issued a safety alert regarding IMBRUVICA (ibrutinib) that was in response to data from "new clinical trials" and "ongoing monitoring of product safety". The issue was serious and fatal events of cardiac arrhythmia or cardiac failure. Another drug, simply known as TGN1412, that was developed to treat arthritis, had no harmful effects when tested on 500 monkeys. However, in human clinical trials, it killed six men and had a 92% failure rate. In less than two hours the human patients had experienced organ failure and brain swelling.

Hundreds of drugs used to treat strokes such as Cerestat, MaxiPost, Zendra, and Lotrafiban have tested safely in animal studies but injured or even killed human patients in clinical trials. These are only a few examples. With so many drugs testing safe among animals, and then revealing previously unknown safety issues when used on people – are we not already testing on humans?

Not only can treatments that test safely in animals prove dangerous to humans, but treatments that have proven hugely beneficial to humans have tested badly with animals. Penicillin is a great example of this. It was delayed by over 10 years by misleading results from rabbit experiments. Had it been tested on guinea pigs, it would likely have been completely discarded. It kills them. Penicillin was the world's first antibiotic. Sir Alexander Fleming, the physician and microbiologist who discovered penicillin, said: "How fortunate we didn't have these animal tests in the 1940s, for penicillin would probably never have been granted a licence, and possibly the whole field of antibiotics might never have been realised."

So what do we do? Newer approaches include human organs grown in the lab, living tissues, organs-on-a-chip, 3D organ and tissue printing, as well as, in the area of toxicology, the Human Toxome Project. As Dr. Akhtar points out, the benefits of these kinds of testing methods for preclinical research over animal models is that they are based on *human* biology. Their use removes the "guesswork" needed when trying to extrapolate physiological findings from animal species to humans.

Canada's University of Windsor has excellent examples of research facilities aimed at alternatives. As stated on their website, "The Canadian Centre for Alternatives to Animal Methods (CCAAM) and the Canadian Centre for the Validation of Alternative Methods (CaCVAM) aim to develop, validate, and promote non-animal, human biology-based platforms in biomedical research, education, and chemical safety testing."

Instead of clinging to historically used animal models, St. Paul's could look to the future and help develop truly innovative approaches as University of Windsor is doing. Building new research complexes seems a wonderful opportunity to do something cutting-edge. Maybe it is actually time for all institutions to reallocate

the lion’s share of their research and development funds to developing non-animal methods and teaching them to researchers.

In answer to the gentleman walking past me as I demonstrated by the new St. Paul’s building site, the man who asked if we should test on humans, perhaps, in a way, the answer is “yes”. We should at least be basing our research on human biology. As for how long I might live if we used such approaches, I am guessing I would have a good chance of living longer.