

FAQ

Why Is Canadian Bioscience Education Stuck in the Past and What Can You Do?

Q1. Why are Canadian students still dissecting animals in 2026?

Canadian science curricula remain heavily reliant on traditional, animal-based methods due to **outdated provincial standards, lack of funding for modern alternatives, and slow adoption of New Approach Methodologies (NAM)**. While countries like the Netherlands and the US are phasing out dissection in favor of digital simulations, organ-on-a-chip models, and AI-driven tools, Canada's curriculum revision cycles (often 5–10 years) and **underfunded teacher training** delay progress. There is also **no dedicated federal funding body for NAM integration** in education, unlike in the EU or UK.

Q2. How does this compare to other countries?

Canada is **falling behind**. The Netherlands has banned animal dissection in secondary schools, the US FDA now accepts NAM-based data for drug approvals, Australia runs a national non-animal research service, and the UK invests in national NAM training hubs. In contrast, **Canadian universities and high schools still treat dissection as a "rite of passage"**, despite evidence that NAMs (e.g., virtual labs, 3D modeling) often yield **better learning outcomes** and align with ethical, cost-effective, and scientifically superior practices.

Q3. Why hasn't Canada adopted NAMs faster?

Three key barriers:

- **Funding gaps:** Provincial education budgets prioritize existing infrastructure (e.g. animal labs) over NAM tools, which require upfront investment in software, hardware, and teacher training. For example, Ontario's 2025–26 education funding gap is **\$1.3 billion**, with no earmarked funds for modernizing science labs.
- **Regulatory inertia:** Health Canada and Environment Canada have **no mandatory NAM adoption policies** for education, unlike the FDA or EMA, which now require NAM consideration in toxicology and drug development.
- **Awareness:** Many educators and policymakers are **unaware of NAM potential** or mistakenly believe animal models are the "gold standard," despite growing evidence to the contrary.

Q4. What are NAMs, and why are they better?

New Approach Methodologies (NAM) are **non-animal, human-relevant** tools like:

- **In silico models** (computer simulations of biological processes).
- **Organ-on-a-chip** (miniature organs that mimic human physiology).
- **AI/ML-driven data analysis** (predicting toxicity or disease mechanisms).
- **Virtual dissection** (interactive 3D models of anatomy).

Advantages:

- **More accurate:** Human-based models better predict human responses than animal tests.
- **Ethical:** No animal suffering or environmental harm.
- **Cost-effective:** Reduces long-term costs (e.g., no need for animal facilities).
- **Future-proof:** Aligns with global industry standards (e.g., pharmaceutical companies now prefer NAMs for drug development).

Q5. How does this affect students' futures?

Students trained in outdated methods **risk being unprepared** for modern careers in:

- **Biotech/pharma:** Companies like Moderna and Pfizer use NAMs for drug discovery.
- **Regulatory science:** Agencies (e.g., FDA, EMA) increasingly require NAM data for approvals.
- **Academic research:** Top journals (e.g., *Nature*, *Science*) prioritize human-relevant studies.

Result: Canadian graduates may lack competitive skills, while their peers abroad gain hands-on experience with cutting-edge tools.

Q6. What can *students* do?

- **Demand change:** Petition your school/universities to **replace dissection with NAMs** (e.g. virtual labs like BioDigital Human or Visible Body).
- **Start a NAM club:** Organize workshops, invite speakers, and collaborate with other groups at school, university, industry levels.
- **Use free NAM tools:** Explore open-access platforms like PhysioEx or iBiology for self-learning.
- **Advocate for policy:** Write to your **MP** (use templates from RAISE) to demand federal funding for NAM education.

Q7. What can *parents* do?

- **Ask schools:** Inquire if your child's science classes use **animal-free alternatives** and request transparency on curriculum modernisation plans.
- **Support NAM initiatives:** Donate to or volunteer with organizations pushing for NAM adoption (e.g., Humane Canada).
- **Lobby policymakers:** Urge your **MP and provincial representatives** to allocate funds for NAM training and resources in schools.

Q8. What can *teachers* do?

- **Adopt NAMs now:** Use free or low-cost tools (e.g., HHMI BioInteractive) to supplement or replace dissection.
- **Advocate for resources:** Push school boards to **fund NAM software/hardware** and provide professional development for teachers.
- **Collaborate:** Partner with universities or biotech companies to access NAM labs or guest lectures.

Q9. What can *politicians* do?

- **Create a federal NAM funding body:** Dedicate **\$50M/year** (a fraction of Canada's \$25B+ sector strategy investments) to:
 - Subsidize NAM tools for schools.
 - Train teachers in NAM methods.
 - Fund research on NAM efficacy in education.
- **Mandate NAM inclusion:** Require provincial curricula to **phase out animal dissection** by 2030, replacing it with NAMs.
- **Incentivize universities:** Tie research grants to **NAM adoption** in undergraduate programs.

Q10. Are NAMs really as effective as animal models?

Yes—and often more so. Studies show:

- **Virtual dissection** improves spatial reasoning and retention better than traditional labs.
- **Organ-on-a-chip** models predict human drug responses **more accurately** than animal tests (e.g. 30% of drugs passing animal tests fail in human trials; NAMs reduce this gap).
- **Cost savings:** Schools in the US saved **40–60%** by switching to digital labs (e.g., zSpace).

Q11. What's the biggest myth about NAMs?

"NAMs are just 'alternatives'—not as good as the real thing."

Reality: NAMs are **not alternatives**—they're **superior tools** for human-relevant science. The term "alternative" implies a compromise, but NAMs are **the future of bioscience**. The EU and US are shifting to NAMs **not for ethical reasons alone**, but because they **work better**.

Weblink: www.pnars.org/projects/youth/raise/