

## Scientific solutions to sin?

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(PhysOrg.com) -- Most people are familiar with the seven deadly sins - pride, envy, gluttony, lust, wrath, greed and sloth - but could there be molecular solutions for this daily struggle between good and evil?

That's what first year bachelor of health sciences students in the undergraduate biology course at McMaster University were asked to find out: their assignment required that they explore the molecular underpinnings of human misbehaviour.

What they discovered garnered them a place at the prestigious American Physiological Society's Experimental Biology meeting in Washington, D.C. this weekend (April 9 - 10). There, they will rub shoulders with more than 10,000 society members who include Nobel Prize winners and hundreds of world-renowned scientists. On Sunday, Faysal Naji, Lauren Salci and Graeme Hoit will give a poster presentation of the UNSIN Project: Exploring The [Molecular Physiology](#) of Sins.

For the project, 181 students were divided into 18 groups, randomly allotted to deal with one of the four deadly sins - sloth, gluttony, lust and wrath. They were expected to read sources to devise molecular ways to counter these sins. Group progress was monitored over 12 weeks by P. K. Rangachari, professor (emeritus) medicine in the Michael G. DeGroote School of Medicine and 3M National Teaching Fellow in the BHSc (Hons) program.

Randomly selected students were not only regularly questioned about the work and its progress but defended their group's approaches to the entire

class. Molecules explored included the neurotransmitters dopamine and serotonin, as well as testosterone and others. A final report was graded.

"Coming in as first year students we expected to be told what to do and be guided," said Faysal Naji, 19. "But, we were faced with the challenge of taking a sin - something we never formerly related to biology - and we had to find out how that sin was somehow related to the body's physiological function."

By getting students to think outside the box, the aim was to come up with the best molecule and design for a drug, or remedy, that counteracts sin.

Students explored everything from the brain and glands to organs. Bi-weekly progress reports with Rangachari in question-and-answer format and one page progress reports taught students the skill of concisely summarizing information without jeopardizing content. "It was really good at challenging you to think on the spot," said Salci, 19.

Students admit verbal fisticuffs erupted when different groups their chosen molecule.

"Arguments were flying left and right," said Naji. To reduce lust, for example, one group suggested targeting testosterone; others chose prolactin or oxytocin. Another group "invented" a wrath-o-meter that would sense changes in brain transmitters that signaled rage attacks and counter that with an automated nasal spray with an anti- wrath drug.

The chosen interventions had to be defensible on scientific grounds. It was in reality an exercise in rationality, logic, synthesis of information and a willingness to transfer learning to something never seen before.

Imaginative solutions offered by the second batch of students included the use of a spray to dispense a molecule to stimulate people to action

and targeting pheromones to counter lust.

"The course was my first opportunity to see what I could do academically," said Hoit. "In high school I was given a test and did well but I never had the chance to go beyond and see how smart I could be. This course challenged me to do that."

At this weekend's meeting, Rangachari has been invited to give the Claude Bernard Distinguished Lecture, named for the 19th century French physiologist who was the first to define homeostasis and one of the first to suggest the use of blind experiments to ensure scientific objectivity.

Provided by McMaster University

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