

# New SPARKS

Three new universities are set to launch SPARK (Students Promoting Awareness of Research Knowledge) programs — the Université du Québec à Montréal, the Université du Québec en Abitibi-Témiscamingue, and the University of Waterloo — as a result of the recent competition. This brings to 14 the total number of current participants.

Through SPARK, students are recruited, trained and paid to write stories based on the NSERC-supported research at their university.



McGill SPARK members (from left) Ian Popple, Jan Cooper, Linda Cooper, Kimberly Krieger, Philippe Chouinard, and Crystal Mann.

The key to a successful program is an enthusiastic and supportive mentor and keen student writers. One such program that has gone a long way since it began just a year ago is McGill's. Following are some excerpts from a story by SPARK writer Ian Popple, versions of which have appeared in *The Montreal Gazette*, *The Globe and Mail*, and *The McGill Reporter*.

For the full story and other McGill stories, visit [www.spark.mcgill.ca/published.htm](http://www.spark.mcgill.ca/published.htm).

For more information on NSERC's SPARK program and stories from other participating institutions, visit [www.nserc.gc.ca/science/spark/index.htm](http://www.nserc.gc.ca/science/spark/index.htm).

## The mother of all hangovers

So you think you get hung over after New Year's? Spare a thought for the poor chipmunk. For six months, chipmunks hibernate about one metre beneath our very feet in a deep form of hibernation called torpor. These animals may appear to have discovered the easy route to spring — who hasn't thought of climbing into bed and sleeping away the winter? Recent research by a team of scientists from McGill University and the University of Sherbrooke however, suggests that torpor is more of a nightmare than a pleasant dream. The hangover that follows a six-month torpor is far worse than any overindulgence in Christmas egg-nog....

"Torpor is commonplace in many animals, including bears, bats and ground squirrels," explained Dr. Murray Humphries, a biologist at McGill University and principal author of the study investigating chipmunk torpor, conducted in collaboration with Dr. Donald Kramer at McGill and Dr. Donald Thomas at Sherbrooke. Hibernators may spend as much as half their life in torpor, but the relative benefits and dangers involved remain unclear and much debated among scientists.

"Previous researchers have suggested that a deeper torpor is a better torpor for hibernating animals such as the chipmunk," said Humphries....

... Humphries' research however, shows that in reality, chipmunks are placing one paw in the grave during torpor.



"Torpor is a necessary response to food scarcity during the cold winter months," explained Humphries. "But there are serious risks involved." During torpor, sensory and motor capabilities are severely reduced. Chipmunks fall into a near brain-dead state where their body temperature drops to within a few degrees of freezing. Heart rate plummets from a 400 beat per minute drum roll, to a 23 beat per minute crawl. Many basic body functions cannot be supported and are shut down, potentially resulting in a dangerous build up of toxins. Brain activity is arrested to such

a degree that chipmunks lose their ability to sleep. Torpor is definitely a strange process to get your head around. "It is hard to conceive of a sleep so deep that it no longer involves sleep," mused Humphries. Sleep deprivation may be one of the reasons that chipmunks rouse periodically from bouts of torpor — they literally have to wake to sleep! Needless to say when chipmunks arouse from torpor they likely carry a hangover of epic proportions. Temporary brain damage, resulting in disorientation and memory loss may take days or weeks to recover from.

The stress that torpor can cause on both the body and mind suggests that given the choice, chipmunks might prefer to minimize, rather than maximize their use of torpor. When the researchers provided chipmunks with an unlimited supply of food, this is exactly what they found. Humphries captured wild chipmunks and attached radio tags capable of transmitting their location and body temperature to a handheld receiver. This information allowed the researchers to determine that chipmunk torpor was of much shorter duration and shallower depth when food was ubiquitous. An unlimited supply of food is a situation that is very unlikely to happen in reality however; so despite the apparent dangers of torpor, it is often the only option for winter survival. Torpor is definitely no picnic for a chipmunk, but then life is not so bad when you consider the alternative.

## News for Animal Users

If you are involved in research that uses animals, you should check out the series of twelve web-based modules recently released by the Canadian Council on Animal Care. The modules cover general core topics for all animal users and specific core topics relating to the organization's National Institutional Animal User Training Program. The modules can be accessed at [www.ccac.ca/english/educat/Intro-NIAUT-Web11.htm](http://www.ccac.ca/english/educat/Intro-NIAUT-Web11.htm).

The CCAC has also made its *guidelines on: the care and use of wildlife* available on its Web site: [www.ccac.ca](http://www.ccac.ca).