

The Incredible Arctic Ground Squirrel

Well, the deep freeze of winter is upon us and I found out again how uncomfortable clearing sidewalks is at -12 degrees, but that is what we expect in West Virginia winters. Winter is also hard on the creatures that God created, and He has designed them with some amazing methods of surviving the cold winter season. Let's look at one such design in the arctic ground squirrel.

The arctic ground squirrel is one of many animals that God designed to survive in the extreme cold region we call the arctic, where temperatures regularly fall to -40° F to -50° F in winter. Yet, we find many animals God created with the ability to survive these temperatures. Some have especially designed hair to insulate the body, while others find a shelter and winter over in that special state we call hibernation. The arctic ground squirrel was designed with extreme physical features.

The arctic ground squirrel in the late summer and fall of the year begins to build body fat by foraging on tundra plants, seeds and fruits. By the end of the summer, the males will begin to store food in their burrows so that in spring they will have a reserve of edible food until new growth begins in late spring.

During the hibernation of the arctic ground squirrel, it can drop its brain to just above freezing and the rest of the body temperature to subzero. Its heart rate drops as low as one beat per minute. The arctic ground squirrel is basically frozen solid! This is a condition called "supercooling." During the long seven to nine-month hibernation, the squirrel will periodically, once every two to three weeks, while it is still asleep, shiver and shake for 12 or more hours to create warmth to bring its body temperature back to normal of about 98° F. It does this using a part of the body called brown adipose tissue or brown fat. It will keep this body temperature for several hours to regenerate its brain, and then, it goes back to being frozen solid again. This is a very rare ability among mammals, and scientists are still trying to understand this physiological behavior that God has designed in the arctic ground squirrel.

Scientists are now studying the hibernation ability of the arctic ground squirrel and how its brain can survive this "brain freeze," and it is hoped to help humans who suffer from neurological disorders like dementia and Alzheimer's disease. When the ground squirrels hibernate, their brain neurons shrink, and many connections between neurons shrivel. However, it appears that the periodic warm up compensates for this loss with massive growth spurts, multiplying nerve links beyond what existed before it started its hibernation. It is still unclear to scientists how this happens, but many believe the answer may involve a protein named the tau protein. Normally tau proteins help stabilize long ropelike parts in the cell's scaffolding called microtubules. Researchers have learned that the tau proteins build up in the brain cells of people with these neurodegenerative disorders. The tau proteins may also be involved with other disorders such as strokes and heart attacks.

So, in the design of the arctic ground squirrel, the master designer may have created the long desired answer to some of mankind's most tragic neural disorders. I hope by looking briefly at this amazing animal, we can be more determined to believe and stand for the truth of God as the Creator of all things.

By: David Everson