

Human Health and Biodiversity Newsletter February 2012

Nature guides research in a wide variety of fields and produces results that support human health and well-being. Up to the minute examples illustrate the fast pace of emerging science, based on the benefits of biodiversity.

Heart cells are renowned for their endurance, but they lack the ability to heal themselves. Many tissues in the body can regenerate when injured, but heart damage is likely to create scar tissue that does not function properly, causing heart failure and permanent disability. Many research facilities are trying to grow new heart cells and have begun to search for materials that can create scaffolding to support stem cell growth. Silk with coarse fibers, from the cocoon of the tasar silkworm (*Antheraea mylitta*), has been found to have some promising components, proteins that allow attachment of heart muscle cells, creating a three-dimensional tissue structure. Communication between the cells was established and they beat together over nearly three weeks, according to scientists at the Max Planck Institute for Heart and Lung Research. *Reported this month in the journal, Biomaterials.*

Thousands of Americans are infected yearly with the resistant form of *Staphylococcus aureus* or MRSA and older antibiotics are becoming less effective. University of Missouri researchers have identified a new chemical which is effective in relatively small concentrations against "superbugs" in the test tube. A common tree in the United States, the Eastern Red Cedar, is the source of the active compounds, isolated from the tree's needles. Potentially, farmers might harvest needles as a renewable resource, without cutting down the trees. *Presented at the International Conference on Gram-Positive Pathogens.*

Controversy has surrounded the anti-aging usefulness of the compound, resveratrol, found in a number of plants and in red wine made from grapes. The active chemical may be able to decrease inflammation, suppress viral infections and reduce some health problems associated with obesity. National Institutes of Health researchers have found that resveratrol changes the way that certain enzymes regulate cell energy usage. Pharmaceutical companies will study this further, hoping to develop new medications. *Resveratrol Ameliorates Aging-Related Metabolic Phenotypes by Inhibiting cAMP Phosphodiesterases. From the journal, Cell, 2012.*

Nicotine is a chemical that tobacco plants produce to defend themselves from plant-eating insects. But this is not a perfect defense. Evolution insures that some insects will develop their own antidotes to nicotine and scientists at the Max Planck Institute for Chemical Ecology are studying these mechanisms. The balance between coyote tobacco (*Nicotiana attenuata*) and the plant's natural adversary, larvae of the tobacco hornworm, illustrate the manner in which specific genes can be switched off through viral manipulation of RNA, making the hornworm vulnerable to the plant's natural defenses. This process is an example of 'yellow' biotechnology, wherein insect genetic and chemical components are studied for broader applications in fields such as agriculture and medicine. *Tobacco Rattle Virus Vector: A Rapid and Transient Means of Silencing Manduca sexta Genes by Plant Mediated RNA Interference. From the journal, PLoS ONE, 2012.*

