

# SCIENTECH CLUB NEWSLETTER

— SCIENTECH —

*The 99<sup>th</sup> year as a forum for the exchange of information in scientific and technical fields  
A club for people who never stop learning*

Meeting at 12 noon on Mondays at Northside K of C, 2100 E. 71<sup>st</sup> St., Indianapolis, IN  
In an emergency, call 317-253-3471  
Luncheon (\$12) @ 11:15 am, Coffee/tea (\$2)      Reservations not needed

**2017**

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<http://www.scientechclub.org>

**Bonnie Carter, President**  
**John Rathman, Secretary**

**Jeff Rasley, VP**  
**John Prentice, Treasurer**

## SCHEDULE

**May**

29 **Memorial Day – no meeting**

**June**

- 5 **Program:** The SnapLink - staying in touch with family in times of dementia  
**Speaker:** Rahil Thanawala, Hamilton county student and app creator: <http://thesnaplink.com/>
- 6 **Board of Directors:** 6:30 pm, Northside K of C
- 12 **Program:** Hands-Only CPR with AED Instruction via Skype  
**Speaker:** William C. Dillon, MD, Interventional Cardiologist; President, Start the Heart Foundation, Louisville, KY
- 19 **Program:** Bridge Accidents / Repair  
**Speaker:** Michael Wenning, PE and Jeremy Hunter, PE
- 26 **Program:** History: Yours and Ours  
**Speaker:** Jacqueline Nytes – CEO, Indianapolis Public Library

See more at: <http://www.scientechclub.org/programs/calendarpagecss.asp>

**5/22 Sciencetech homework: Why did MLB baseball season end on 9-1-1918?  
Answer at**

<https://www.aol.com/article/2015/09/01/this-day-in-1918-mlb-season-ends-due-to-world-war-i/21229745/>

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**High levels of exercise linked to nine years of less aging at the cellular level**

New research shows a major advantage for those who are highly active

May 10, 2017  
Brigham Young University

Despite their best efforts, no scientist has ever come close to stopping humans from aging. Even anti-aging creams can't stop Old Father Time.

But new research from Brigham Young University reveals you may be able to slow one type of aging -- the kind that happens inside your cells. As long as you're willing to sweat.

"Just because you're 40, doesn't mean you're 40 years old biologically," Tucker said. "We all know people that seem younger than their actual age. The more physically active we are, the less biological aging takes place in our bodies."

The study, published in the medical journal *Preventive Medicine*, finds that people who have consistently high levels of physical activity have significantly longer telomeres than those who have sedentary lifestyles, as well as those who are moderately active.

Telomeres are the protein endcaps of our chromosomes. They're like our biological clock and they're extremely correlated with age; each time a cell replicates, we lose a tiny bit of the endcaps. Therefore, the older we get, the shorter our telomeres.

Exercise science professor Larry Tucker found adults with high physical activity levels have telomeres with a biological aging advantage of nine years over those who are sedentary, and a seven-year advantage compared to those who are moderately active. To be highly active, women had to engage in 30 minutes of jogging per day (40 minutes for men), five days a week.

"If you want to see a real difference in slowing your biological aging, it appears that a little exercise won't cut it," Tucker said. "You have to work out regularly at high levels."

Tucker analyzed data from 5,823 adults who participated in the CDC's National Health and Nutrition Examination Survey, one of the few indexes that includes telomere length values for study subjects. The index also includes data for 62 activities participants might have engaged in over a 30-day window, which Tucker analyzed to calculate levels of physical activity.

His study found the shortest telomeres came from sedentary people -- they had 140 base pairs of DNA less at the end of their telomeres than highly active folks. Surprisingly, he also found there was no significant difference in telomere length between those with low or moderate physical activity and the sedentary people.

Although the exact mechanism for how exercise preserves telomeres is unknown, Tucker said it may be tied to inflammation and oxidative stress. Previous studies have shown telomere length is closely related to those two factors and it is known that exercise can suppress inflammation and oxidative stress over time.

"We know that regular physical activity helps to reduce mortality and prolong life, and now we know part of that advantage may be due to the preservation of telomeres," Tucker said.

**Addendum to last week's talk on Medicine in Antarctica**

For more information on last week's talk on the Antarctica see [Byrd Polar and Climate Research Center \(https://bpcrc.osu.edu/\)](https://bpcrc.osu.edu/) and the Antarctic sun [Tha Antarctic Sun \(https://antarcticsun.usap.gov/\)](https://antarcticsun.usap.gov/)

### **Today's Presentation**

**Program:** Antibiotic Resistance

**Speaker:** Robert Baker, MD, Internal Medicine and Infectious Diseases, Community Health Network

**Introduced by:** Dave Bash

**Attendance:** 108

**Guests:** John Morrical Jr., Nick Beckert, Martin Rice, Jim Stohler, Patricia Keener, Christine Ward, Sandra Bettner

**Scribes:** Joyce and Malcolm Mallette

**Editor:** Bill Elliott

Dr. Robert Baker, MD graduated from Ball State and received his MD from IU Medical School. He is a specialist in Internal Medicine and Infectious Diseases at the Community Health Network. Dr. Baker gave a very interesting and up-to-date presentation on antimicrobial resistance.

The primary problems with antimicrobial resistance occur with the following bacterial infections:

- MRSA/ VISA/ VRSA
- VRE
- Flouroquinolone resistance
- ESBL producers
- Carbapenemase producers
- *Acinetobacter* species
- *Pseudomonas aeruginosa*
- *Candida* species
- Influenza
- *Mycobacterium tuberculosis*/ malaria

In the United States there are 2 million serious infections and 23,000 deaths per year from antibiotic resistant organisms. The sources of the problem include the fact that 50% of antibiotics used are not appropriate or optional and 62% of antibiotics used in animals are medically important in humans. Health care associated infections result from clearing of the natural flora with antibiotics and cross contamination.

Some antibiotic resistance is unavoidable as it was present before the antibiotic was first used. Other antibiotic resistance is preventable. Some resistance results from doctors wanting to give the best treatment or excessive dosing. Inappropriate prophylaxis, use of multiple agents and pressure from the patient to prescribe something are also a factor. There are time constraints, cost and time for diagnostic tests, malpractice considerations and fear of litigation that all lead to excessive use of antibiotics. There are also many seminars by drug makers who push their products.

Antibiotics are not benign drugs and the absolute indications for their use are sepsis, neutropenic fever and documented infections. Development of new antibiotics is very slow and some old retired drugs are being pulled off the shelf and used despite their side effects as they are effective when nothing else is.

To help prevent excessive use of antibiotics there are Antibiotic Stewardship Programs required of hospitals by regulators and third party payers. The period of antibiotic use should be limited to what is necessary, usually a short-term course of treatment. The Indiana Coalition for Responsible Antibiotic Use has been started by the Butler Faculty and is working with practitioners, patients and families in the Indianapolis area.

Alternative new drugs are also important to treat infections that are resistant to current antibiotics. Development is slow with only 4 anti-infective drugs approved in 2106. Dr. Baker predicts that in the future we will be able to stimulate the immune system to target the infectious agent and antibiotic use will decline.



**Dr. Robert Baker**