JOHNS HOPKINS
MEDICINE

DEPARTMENT OF
ORTHOPAEDIC SURGERY

# HELP US FORWARD

## THE OSTEOBIOLOGY LABORATORY @JOHNS HOPKINS

**Arabella I. Leet, M.D.**
Assistant Professor
Department of
Orthopaedic Surgery

**Neal Fedarko, Ph.D.**
Associate Professor
Department of Medicine
Division of Geriatrics

**Tamara Kazarian, M.S.**
Research Technician
Department of
Orthopaedic Surgery

**Alka Jain, Ph.D.**
Research Specialist
Department of Medicine
Division of Geriatrics

**Frank J. Frassica, M.D.**
Professor & Chair
Department of
Orthopaedic Surgery

**The Osteobiology Laboratory at Johns Hopkins** was created to promote the **study of bone cells and fracture healing**.

We maintain a special library of osteoblasts (cells that make bone) and their parent cells (bone marrow stromal cells) in order to study how changing conditions influence cell behavior.

Currently our laboratory is **looking at the behavior of normal cells versus those from patients with brittle bone disease (osteogenesis imperfecta) which have been exposed to the drug class bisphosphonates.**

**Bisphosphonates are thought to act primarily to inhibit osteoclasts** (cells that absorb bone), and they are not thought to influence osteoblasts. But, **our laboratory has recently demonstrated** that **bisphosphonates can both promote and decrease growth** depending on the genetic make up of the **osteoblast**.

These unusual findings have garnered us special recognition in the field of basic science research.

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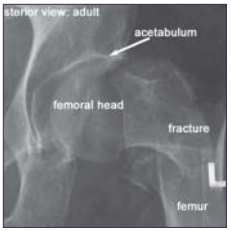
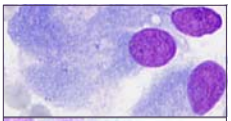
# OUR WORK

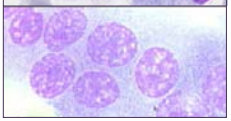
**Disorders of Soft Bone**
osteogenesis imperfecta
fibrous dysplasia




**Fracture Healing**

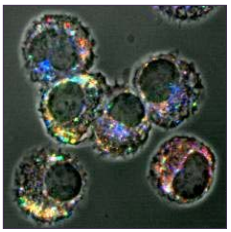


**Osteoblasts**
cells that make bone



**Osteoclasts**
cells that remove bone & send messages to osteoblasts

**Bone Matrix**
the materials that surround bone cells



**Drugs that Alter Bone Growth**

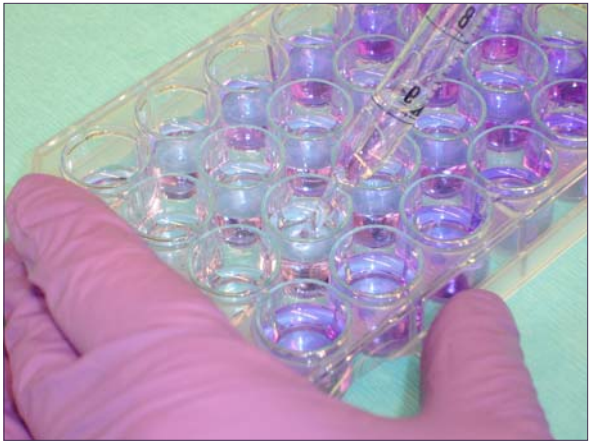
Our research is **important to patients with disorders such as osteogenesis imperfecta, osteoporosis, or fibrous dysplasia, all of which result in the bone becoming soft.**

**Bone that is soft tends to break or bend causing deformity.** Also **bone that is not strong is not as readily amenable to** traditional orthopedic **surgical treatment such as screws** which require purchase in the bone.

**Drugs such as bisphosphonates may help bone become strong and more resilient, but must be used carefully to not create harmful side effects** as bone is at all times in a balance of formation by osteoblasts and resorption by osteoclasts.

We hope that **by understanding how to make soft bone strong again** we can **improve the surgical outcomes** of our orthopedic surgery patients. The work done in our lab with osteogenesis imperfecta will one day help patients have **better surgeries** or **eliminate the need for surgery** altogether.

**Our lab unites clinicians and scientists** who have the common goal of understanding the biology of bone - the details of structure and function. Our team is formed from a collaboration between the Departments of Medicine & Orthopaedic Surgery at Johns Hopkins. We are located in the Asthma & Allergy Building on the Bayview Campus.



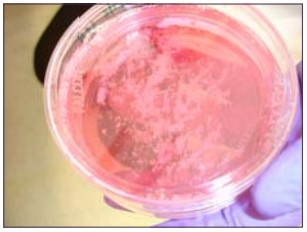
# Resources For Research

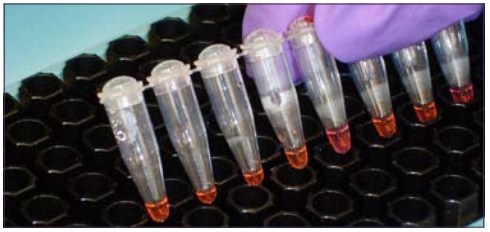
## Food & Housing

Cells dine on cow serum, antibiotics, growth media and vitamins.

Cells grow on plastic plates and are housed in incubators on plastic dishes. These must be changed to new plates continually or growth stops when the cells fill the plate.

**Plastic dishes, media and other supplies are constantly needing to be purchased.**

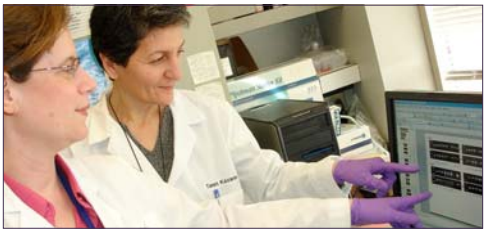




## Equipment

**We need small pieces of equipment** such as x-ray machines, microscopes and PCR machines.

**PCR:** This state-of-the-art desktop machine amplifies DNA and simultaneously quantifies the amount generated. This allows comparisons to be made between precise amounts of a gene in one sample versus another. But, small in size doesn't mean small in price. One PCR machine is $60,000.



## Computers & Software for Data Analysis

From checking references in the literature to ordering test tubes to analyzing our results–everything, it seems, requires **computers**, and **we could use more of them!**

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# THANKS FOR YOUR GENEROSITY

## From OR:

## To Lab:

## And Back!

Philanthropy has always played a crucial role in supporting the Johns Hopkins University's tripartite mission: patient care, education, and research. **Gifts from our donors (people like you) allow us to make significant discoveries** in the laboratory and **to apply the results in the clinic.**

Some people give money to Hopkins out of gratitude. Giving is their way of saying thank-you for the care they have received. Others give because they are frustrated that a cure or treatment regimen has not yet been identified.

Your gift, large or small, could support a specific initiative, enable us to purchase a piece of highly specialized equipment, or help a researcher create the next breakthrough. **Gifts of any amount are gratefully welcomed.**

It takes huge amounts of capital to conduct research of the caliber that we do at Johns Hopkins.

**We thank you for your part in helping us to be the best.**

*Gifts in the form of checks may be made out to:*
***"The Osteobiology Laboratory at Johns Hopkins"*** *and sent to:*
*Dr. Arabella I. Leet, 601 North Caroline Street, JHOC, Suite 5253, Baltimore, MD 21287-0882*