



HISTOPATHOLOGY

COURSE 1

INTRODUCTION TO HISTOPATHOLOGY

Sawa University

جامعة ساوة الاهلية

College of health and medical techniques

كلية التقنيات الصحية والطبية

Department of Medical Laboratories

قسم تقنيات المختبرات الطبية

. Third Stage

المرحلة الثالثة

محاضرة رقم 1

الجانب النظري

Lecture No.. 1

Theoretical

تدريسي المادة : م.د. قاسم عباس محمد

OBJECTIVES

Learn some terms related to pathology and histopathology.

OVERVIEW OF IMPORTANT DEFINITIONS

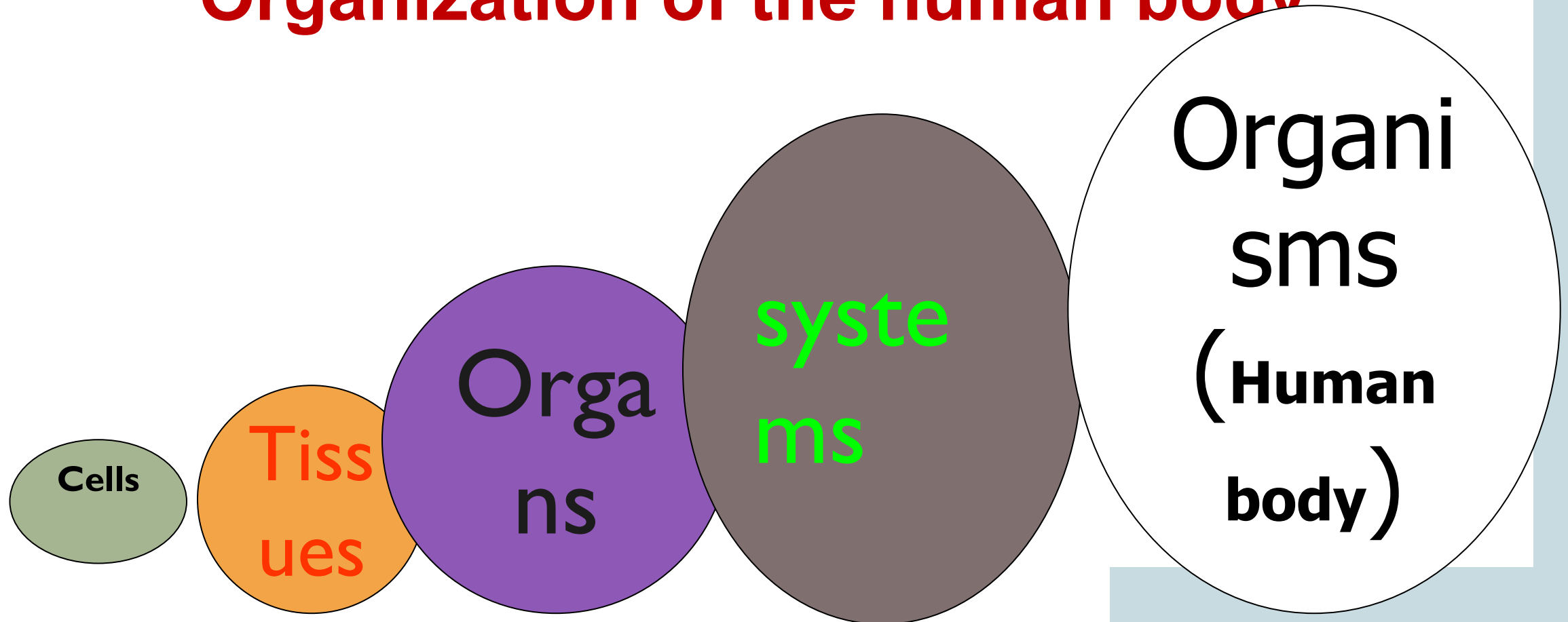
Cell: the smallest structural and basic functional unit of body that is responsible for all of life's processes.

A TISSUE : Is a mass of similar cells and cell products that arise from the same region of the embryo and work together to perform a specific structural or physiological role in an organ.

An organ : is a group of similar or different tissues performed one or multiple functions .e.g. liver, kidney.

A system : is a group of organs in the body

— Organization of the human body



Histology: Is the study of tissues and organs through the examination of the Microscopical architecture, and the relationship between cells and tissue types.

Pathology: is the study of disease by scientific methods. The word pathology came from the Latin words “**patho**” & “**logy**”.

‘Patho’ **means disease** and ‘logy’ **means study**, therefore pathology is a scientific study of disease.

Diseases : defined as an abnormal variation in structure or function of any part of the body.

Pathology gives explanations of a disease by studying the following four aspects of the disease.

1. Etiology : cause of disease

2. Pathogenesis: mechanism of disease

3. Morphologic changes: structural alterations in cells or tissues

4. Functional derangements and clinical significance: The morphologic changes in the organ influence the normal function of the organ. By doing so, they determine the clinical features (symptoms and signs), course, and prognosis of the disease

Histopathology: it is a branch of pathology which deals with the study of disease in a tissue section

- * Specializes in the histologic study of diseased tissue.
- * It is important tool of anatomical pathology.
- * It is used for accurate diagnosis of cancer and other diseases.

Cytology: is the scientific study of cells obtained from tissues or body secretions to identify disease

STEPS IN HISTOPATHOLOGY

1. PREPARATION OF SAMPLE

A. Sample Collection

- * Biopsy (with patient history)
 - * Autopsy
 - * CSF (Cerebrospinal fluid)
 - * Bones (with X-ray)
 - * Body fluids
 - * Skin tissues
- Etc.....

A Biopsy: sample of tissue or organ from living case.

Types of Tissue Biopsy:

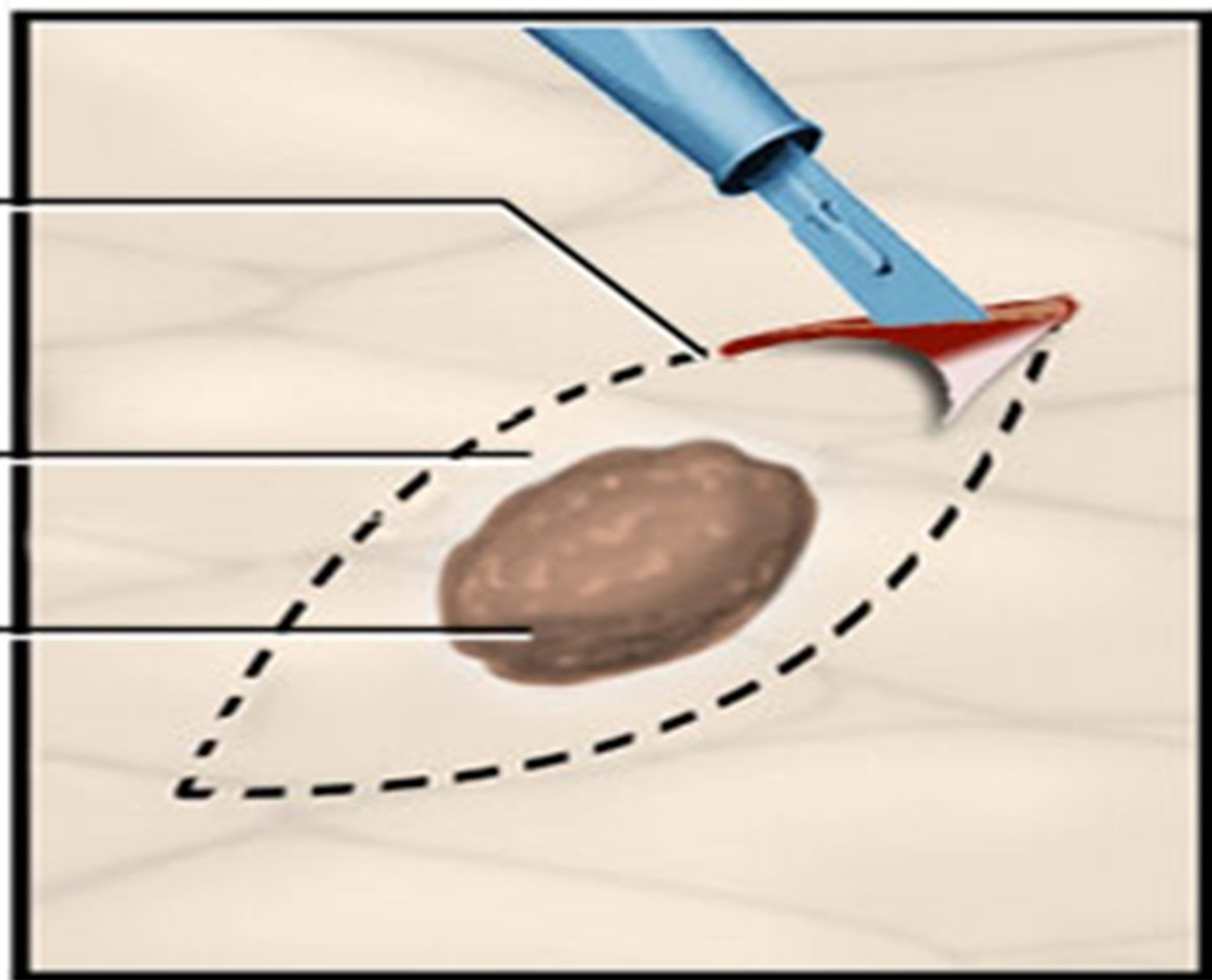
- **Excisional biopsy** :the whole lesion is excised to give histological diagnosis.
e.g. skin lesion.
- **Incisional biopsy**: Part of the lesion is removed, Performed when the lesion is too big.
- **Core biopsy** : Performed by using circular cutting needle= core of tissue. e.g. renal, liver biopsy.
- **Fine-needle aspiration**: A long, thin needle is inserted into the suspicious area
- **Endoscopic biopsy**: Endoscopic biopsy associated with endoscopye.g. GIT.

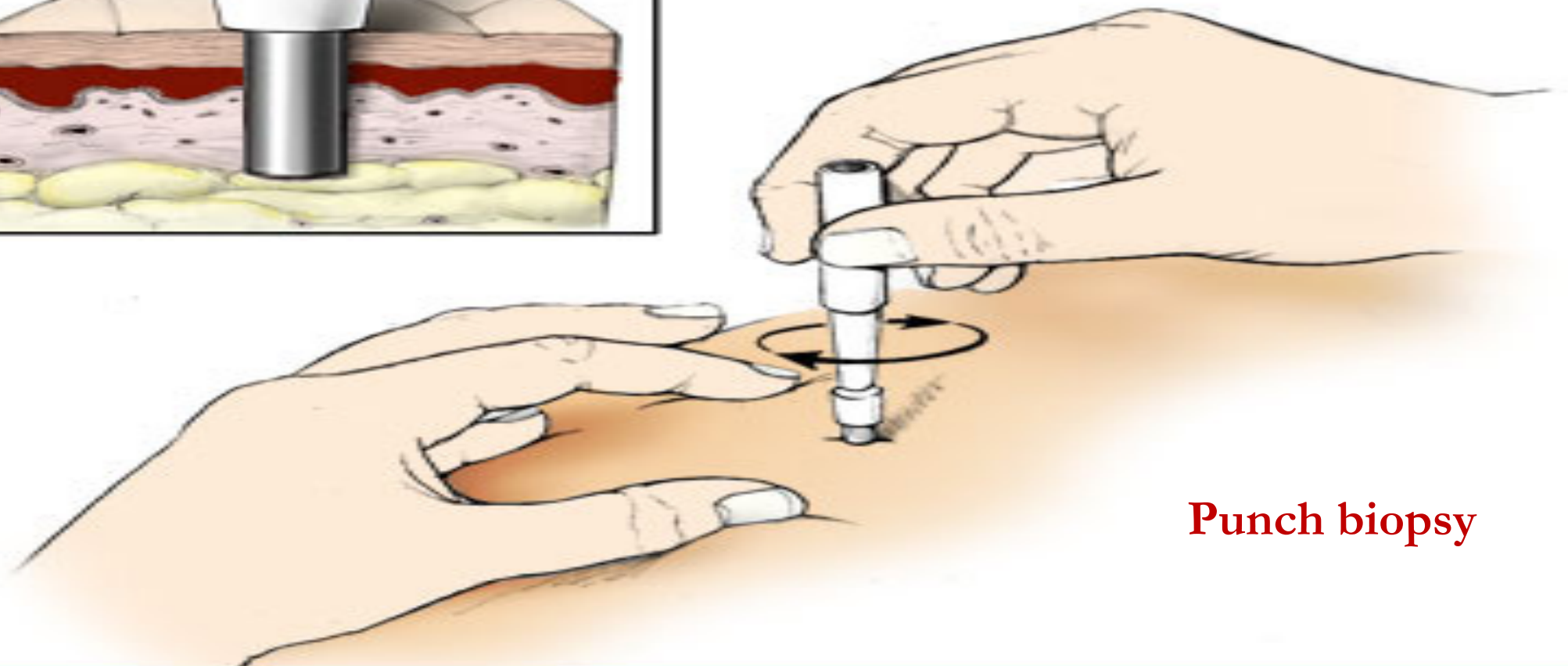
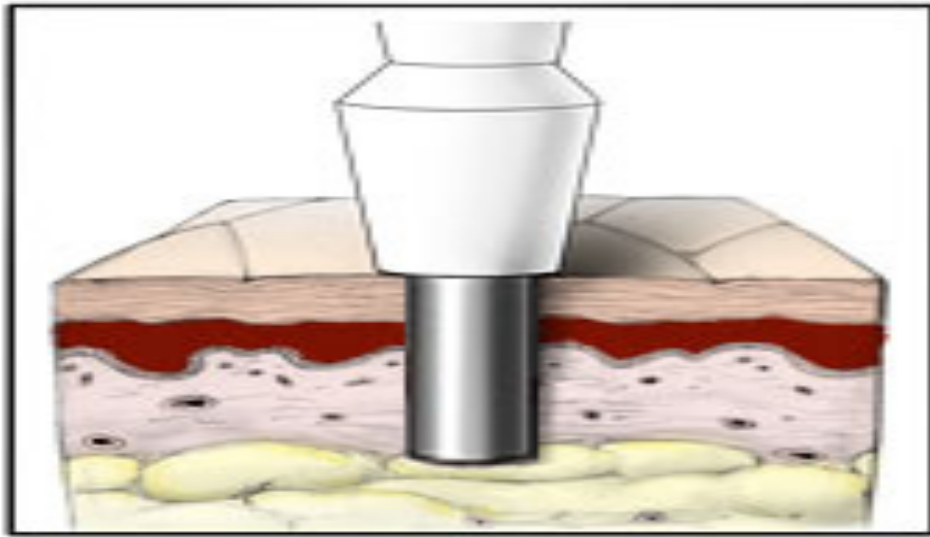
- **Punch biopsy:** Skin biopsy in which a circular tool is used to remove a small section of skin's deeper layers.
- **Shave biopsy:** Skin biopsy in which tool similar to a razor is used to scrape the surface of the skin.
- **Dilation and curettage (D&C) biopsy:** Is a procedure in which the cervix of the uterus is expanded (dilated) so that the uterine lining (endometrium) can be removed with a spoon-shaped instrument called a cruet or curette.

Incision

Safety margin
of normal skin

Skin lesion





Punch biopsy

An Autopsy: sample of tissue from dead case

Types of Tissue Autopsy:

- **Forensic autopsy:** For legal purpose
- **Clinical/ academic autopsy:** For research and study purposes.

B. Fixation

A Chemical process by which biological tissue are preserved from decay either through autolysis or putrefaction.

2.PROCESSING OF SAMPLE

A. Dehydration

- Removal of fixative and water from tissue.

Commonly used dehydrating agents

1. Alcohol
2. Acetone
3. Diethylene dioxide

B. Clearing

- Clearing is remove alcohol from tissues and is replaced by fluid which is miscible with wax with which tissue must be impregnated

Commonly Used Clearing Agents In Laboratory

- Benzene
- Xylene
- Toluene
- Choloroform

C. Infiltration /Impregnation

: is to remove the clearing agent from the tissue and to completely permeate the tissue with paraffin wax.

- This will allow the tissue to harden and produce a wax block from which thin histological sections can be cut.

Commonly used infiltration medium

Paraffin is the most commonly used medium for infiltration, embedding and formation of tissue blocks.

D. Pre embedding / Embedding

- Once tissue samples are infiltrated by paraffin they are removed from the cassettes and carefully positioned inside a metal base mold.
- The mold is filled with melted paraffin and then immediately placed on a cooling surface.

E. Sectioning

- The paraffin block is mounted on the microtome holder.
- Sections are cut as a ribbon and floated on hot water bath maintained at 45°C to stretch the paraffin section.
- Tissue section are then allowed to dry at room temperature or 37°C.



F. Staining Methods

1. Hematoxylin
2. Orange Green 6
3. Eosin Azure
4. Light green SF
5. Bismarck brown Y

REFERENCES

1. Vinay, K., Ramzi S. Cotron, and Stanley L. Robbins (2002); basic pathology, 7th Edit. Philadelphia, pennsylvania.
2. Suvarna, K. S., Layton, C., & Bancroft, J. D. (2018). *Bancroft's theory and practice of histological techniques E-Book*. Elsevier health sciences.

Any questions?

*Thank
You*