INTERNATIONAL COLLEGE OF PHARMACEUTICAL INNOVATION
国际创新药学院

Resilience

PF2: The Scientist: Professional Formation 2

Assoc Prof. Caoimhe Clerkin

24.3.25

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Welcome

- Learn what resilience is and why it's crucial for academic and personal success.
- Explore the role of resilience in overcoming challenges in your studies and future research careers.
- Discover effective techniques and strategies to build and strengthen resilience.

ASSESSMENT

- You will be assessed in this module by continuous assessment (100%) and is comprised of three assessment tasks
- **Assessment Task 1:** Abstract Development (40%)- Due date 7th April and relates to workshop delivered on 24th March
- **Assessment Task 2:** Mock interview(30%)- Will be scheduled for the week commencing 7th April and relates to workshop delivered on 17th and 31st March
- **Assessment Task 3:** Reflective Writing (30%)- Due date 21st April and feedback you have received from assessment task 1 and 2 and learnings from PF1 and PF2.

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Part 1: Your first task

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The Tower Challenge

In your group, you have **20 minutes** to build the **tallest free-standing tower** using only the materials provided. The tower **must stand on its own for 30 seconds**. The tallest tower will win.

Materials provided:

Spaghetti

Marshmallows

Tape

String

Scissors

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Debrief

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Part 2: Understanding Resilience

Please only answer ONE question at a time

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What ONE word comes to mind when you think of resilience?

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Resilience

Resilience is the psychological capacity to adapt to stressful circumstances and bounce back from adverse events. It's about maintaining mental well-being despite facing challenges and setbacks

Key components of resilience are:

- Being able to adapt to changing circumstances
- Being able to control our emotions
- Problem solving
- Managing challenging conversations
- Having self compassion
- Having social support
- Having purpose and meaning
- Having a good mindset

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Passion for science

Humour and creativity

Curiosity

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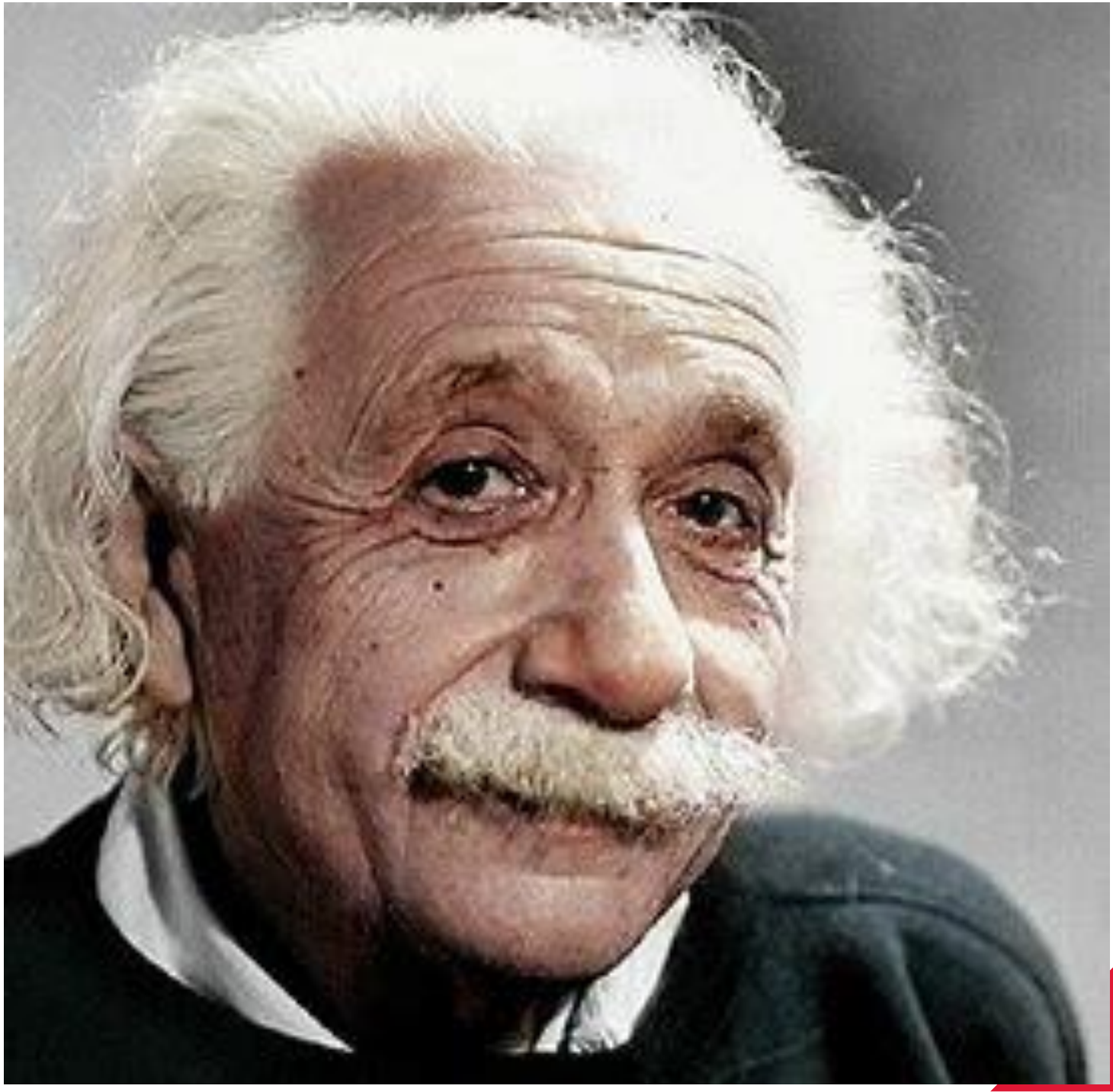
Curiosity

Imagination

Persistence



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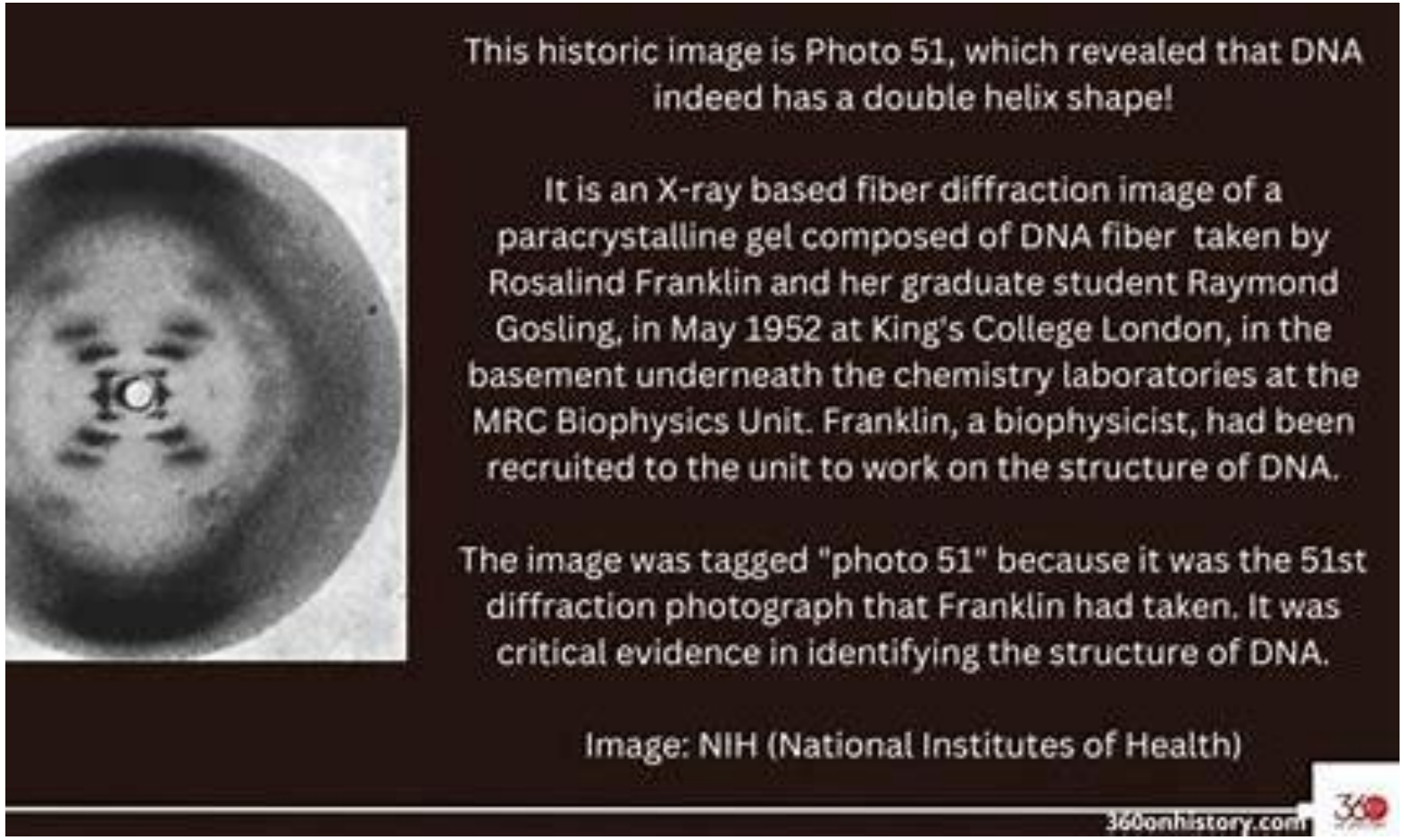

Determination

Focus on work

Navigating workplace politics (challenging conversations

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Resilience in Academic Research Careers

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When do you think you will be required to demonstrate resilience?

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Resilience in Academic Research Careers

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What will help you remain resilient during your studies?

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Part 3: Building Resilience

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Resilience

Resilience is the psychological capacity to adapt to stressful circumstances and bounce back from adverse events. It's about maintaining mental well-being despite facing challenges and setbacks

Key components of resilience are:

- Being able to adapt to changing circumstances
- Being able to control our emotions **– meditation, deep breathing**
- Problem solving
- Managing challenging conversations- **Skills from Prof. Kirby's lecture**
- Having self compassion
- Having social support- **working together as a team**
- Having purpose and meaning
- Having a good mindset – **later in the module**

HEALTH & WELLBEING FOR ALL

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Debrief
Answer ALL questions

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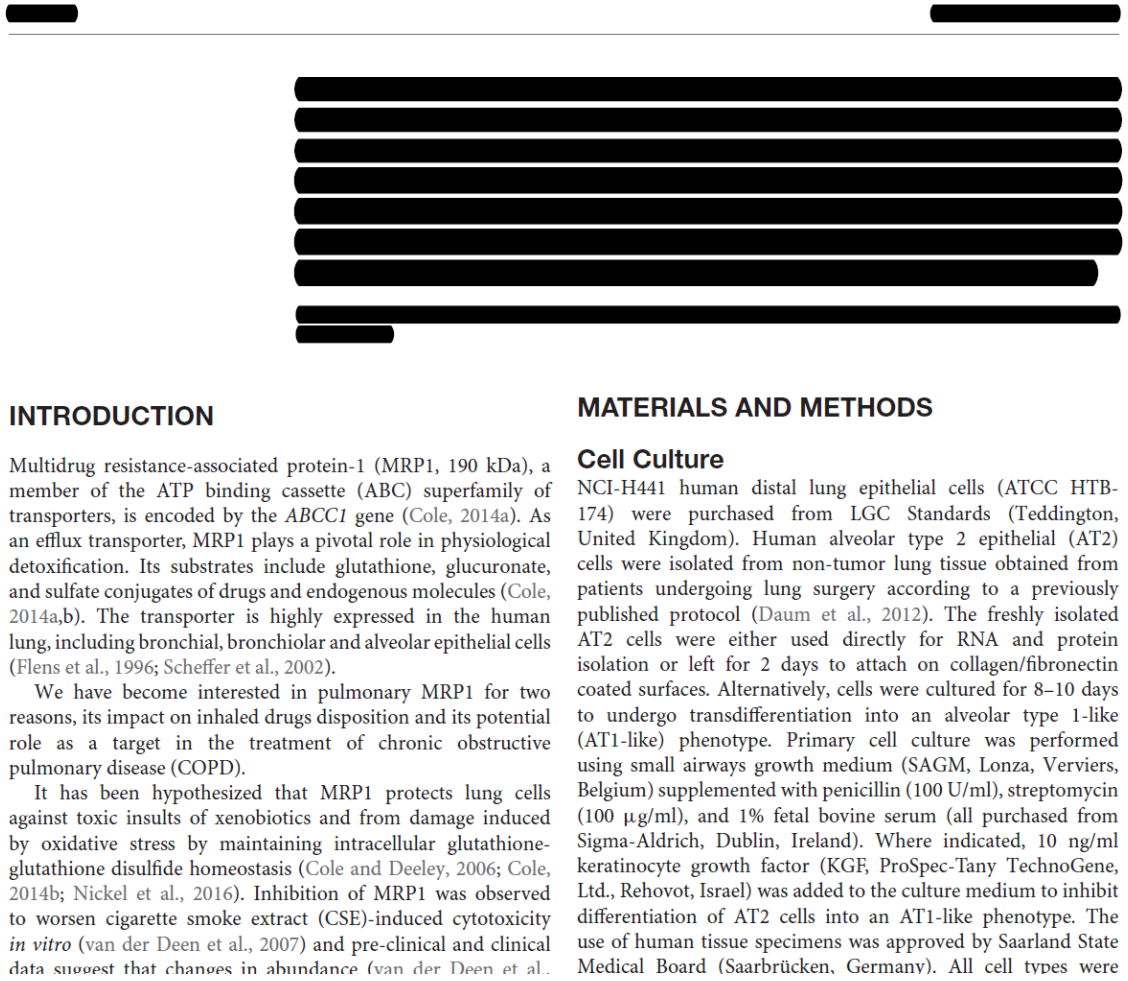
Homework for next class on Thursday 27th March (ICPI R503)

Complete the worksheet on moodle by addressing the following questions

1. Summarise the background
2. State the papers main aim
3. What scientific experiments/methods were used
4. What were the results
5. What were the main conclusions
6. What future work could be done to improve this research



INTRODUCTION

Multidrug resistance-associated protein-1 (MRP1, 190 kDa), a member of the ATP binding cassette (ABC) superfamily of transporters, is encoded by the *ABCC1* gene (Cole, 2014a). As an efflux transporter, MRP1 plays a pivotal role in physiological detoxification. Its substrates include glutathione, glucuronate, and sulfate conjugates of drugs and endogenous molecules (Cole, 2014a,b). The transporter is highly expressed in the human lung, including bronchial, bronchiolar and alveolar epithelial cells (Flens et al., 1996; Scheffer et al., 2002).

We have become interested in pulmonary MRP1 for two reasons, its impact on inhaled drugs disposition and its potential role as a target in the treatment of chronic obstructive pulmonary disease (COPD).

It has been hypothesized that MRP1 protects lung cells against toxic insults of xenobiotics and from damage induced by oxidative stress by maintaining intracellular glutathione-glutathione disulfide homeostasis (Cole and Deeley, 2006; Cole, 2014b; Nickel et al., 2016). Inhibition of MRP1 was observed to worsen cigarette smoke extract (CSE)-induced cytotoxicity *in vitro* (van der Deen et al., 2007) and pre-clinical and clinical data suggest that changes in abundance (van der Deen et al.,

MATERIALS AND METHODS

Cell Culture

NCI-H441 human distal lung epithelial cells (ATCC HTB-174) were purchased from LGC Standards (Teddington, United Kingdom). Human alveolar type 2 epithelial (AT2) cells were isolated from non-tumor lung tissue obtained from patients undergoing lung surgery according to a previously published protocol (Daum et al., 2012). The freshly isolated AT2 cells were either used directly for RNA and protein isolation or left for 2 days to attach on collagen/fibronectin coated surfaces. Alternatively, cells were cultured for 8–10 days to undergo transdifferentiation into an alveolar type 1-like (AT1-like) phenotype. Primary cell culture was performed using small airways growth medium (SAGM, Lonza, Verviers, Belgium) supplemented with penicillin (100 U/ml), streptomycin (100 µg/ml), and 1% fetal bovine serum (all purchased from Sigma-Aldrich, Dublin, Ireland). Where indicated, 10 ng/ml keratinocyte growth factor (KGF, ProSpec-Tany TechnoGene, Ltd., Rehovot, Israel) was added to the culture medium to inhibit differentiation of AT2 cells into an AT1-like phenotype. The use of human tissue specimens was approved by Saarland State Medical Board (Saarbrücken, Germany). All cell types were

Be prepared to present