Statistical Methods in Pharmacy

PRESENTATION OF THE ELECTIVE COURSE
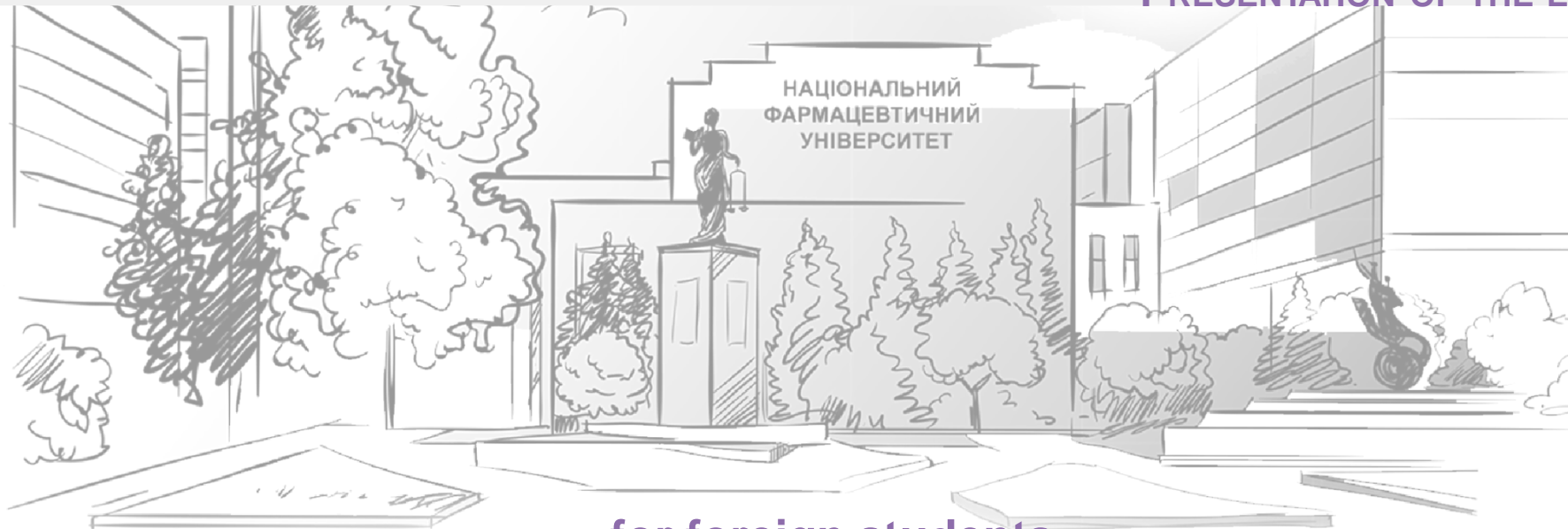
for foreign students

educational program "Pharmacy", specialty 226 "Pharmacy and industrial pharmacy"

PHARMACY TASKS, THAT REQUIRES THE APPLICATION OF STATISTICAL METHODS

- Testing the efficacy and safety of drugs (preclinical and clinical trials)

- Validation of analytical methods for drug quality control

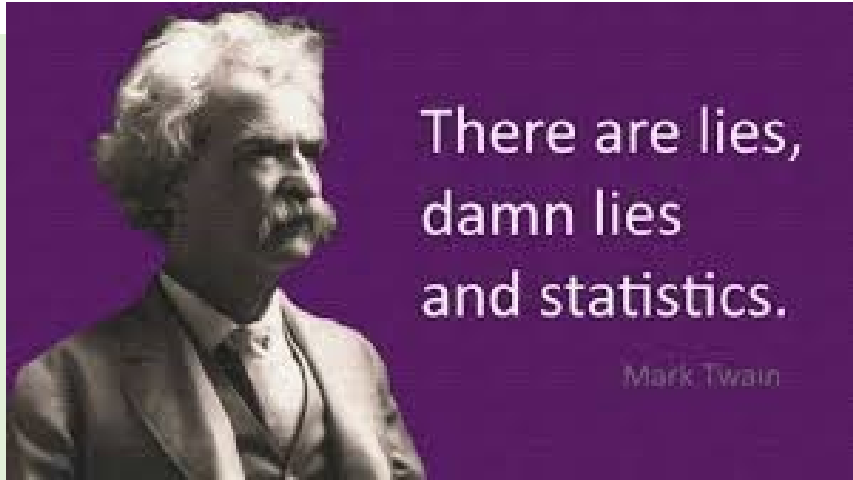- Selection of optimal methods of qualitative and quantitative analysis of substances in the development of pharmaceuticals

- Pharmaceutical market research, needs and provision of medicines to the population (pharmaceutical marketing, social pharmacy)

- Optimal research planning
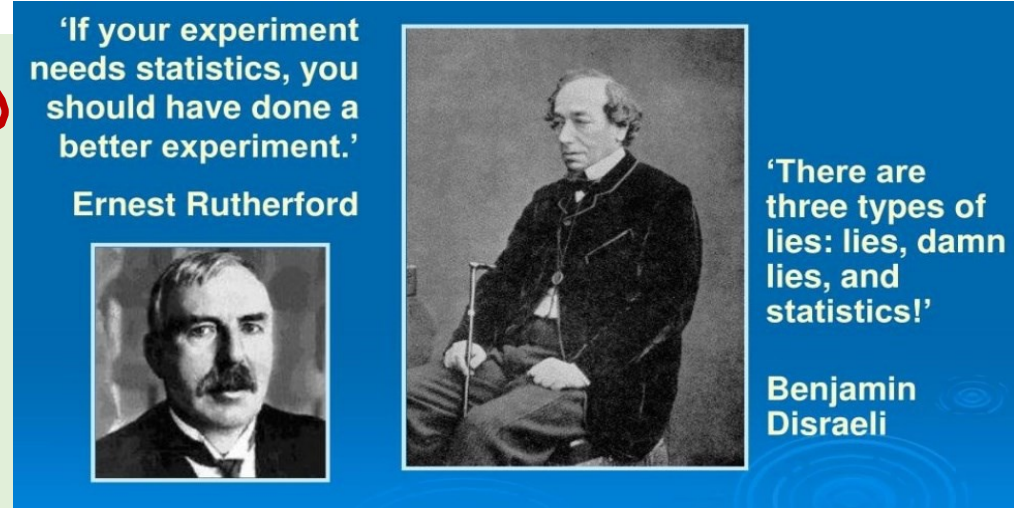
WHAT IS ACTUALLY STATISTICS?

There are lies, damn lies and statistics.

Mark Twain

Not our case

'If your experiment needs statistics, you should have done a better experiment.'

Ernest Rutherford

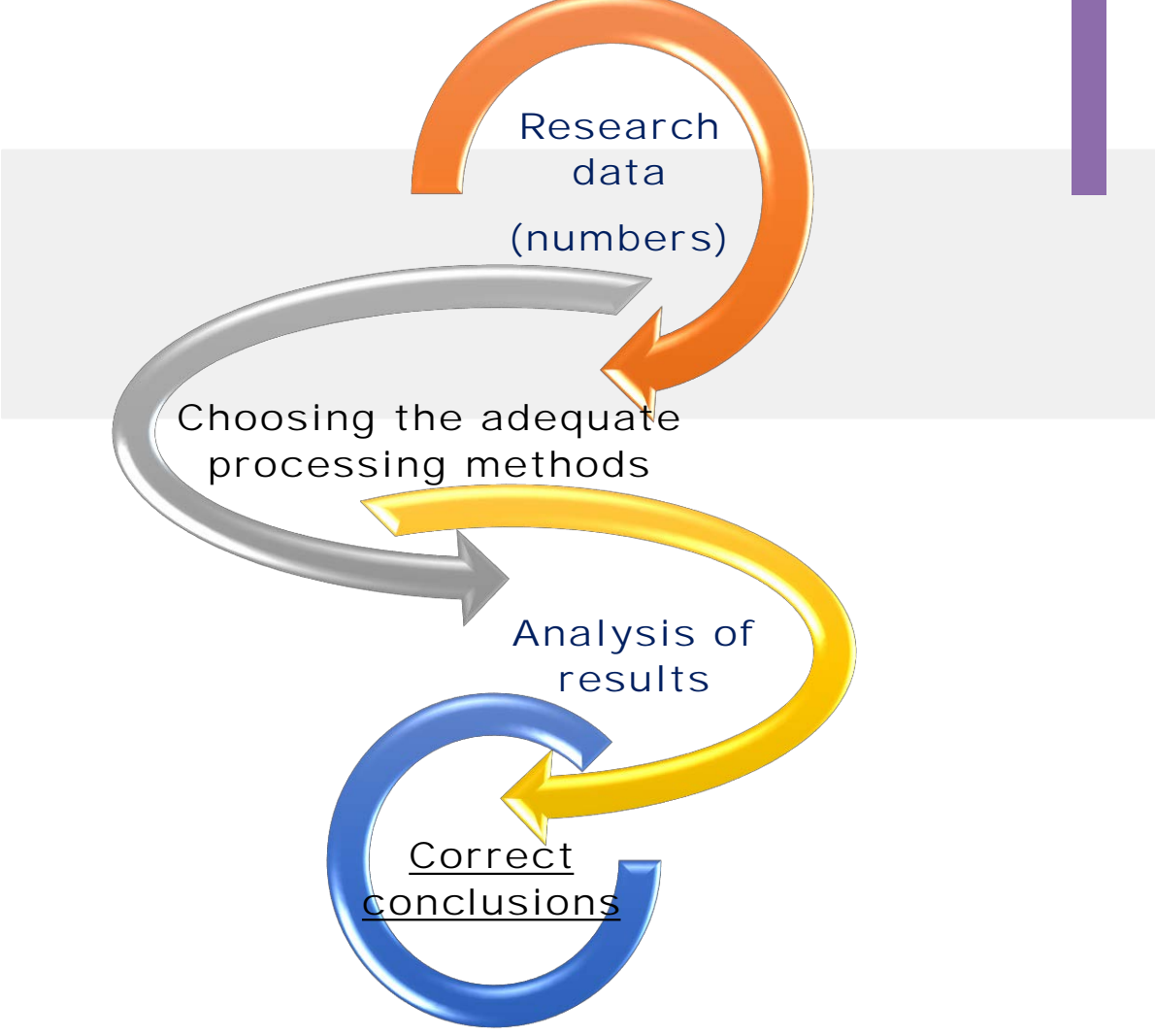'There are three types of lies: lies, damn lies, and statistics!'

Benjamin Disraeli

After studying this course, you will get rid of such misconceptions and will be able to adequately and critically evaluate reports on pharmaceutical and medical research in terms of mathematical and statistical justification of the stated results.

WHAT IS ACTUALLY STATISTICS

Our case

Research data (numbers)

Choosing the adequate processing methods

Analysis of results

Correct conclusions

IN GOD WE TRUST ALL OTHERS MUST BRING DATA

The knowledge of numbers and mathematics works in pharmacy and in real life

WHY DO PHARMACISTS NEED TO KNOW STATISTICS?

Even if you are not going to devote your future professional activity to research, the <u>knowledge of statistical methods</u> will help you to understand and critically evaluate various reports on the latest developments in medicines, to <u>reasonably</u> implement them in your own practice, recommend or advise them to your clients, relatives, colleagues….

AFTER COMPLETING THIS COURSE YOU WILL BE ABLE TO

- **apply in practice statistics methods and the capabilities of general and special computer programs to solve problems related to the analysis of experimental data;**

- **carry out the comparative analysis of medicines for the purpose of their safe and rational application with use of statistical methods and computer technologies;**

- **apply computer technology tools to implement mathematical and statistical methods in research and quality control;**

- **perform statistical analysis of data at different stages of research to understand and interpret the results;**

- **apply statistical techniques for assessing and ensuring quality of works and studies at a level corresponding to modern international standards;**

- **acquire the ability to abstract thinking, analysis and synthesis, to learn and be modernly trained;**

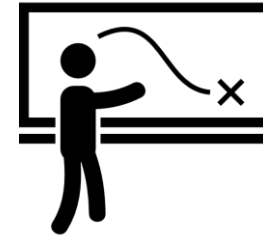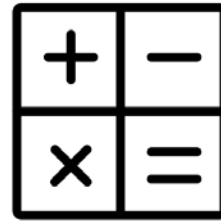- **understand the subject area and profession more deeply**

WHAT SHOULD YOU KNOW TO STUDY THIS COURSE

The following pre-acquired skills and knowledge are required to study this discipline:

1

- **basic knowledge of mathematics and statistics**

2

- **skills of using office programs:**

3

  - **word processor - entry level**
  - **spreadsheets - confident user**

A necessary condition is a preliminary study of the discipline "Information Technology in Pharmacy"

TOPICS THAT WE WILL MASTER

- **Topic 1.** Probabilities of random events. Basics of the theory of random variables
- **Topic 2.** Some laws of distribution of discrete and continuous random variables
- **Topic 3.** Methods of pre-processing and exploratory analysis of quantitative data. Descriptive statistics. Analysis of variation series.
- **Topic 4.** Statistical inference method. Statistical criteria, their significance and power. Confidence probability and p-level. Graphical representation of statistical data
- **Topic 5.** Parametric and nonparametric methods for comparative measures of central tendencies and dispersion. Dependent and independent random variables. Statistical hypotheses testing
- **Topic 6.** Analysis of variance. Nonparametric methods of factor analysis
- **Topic 7.** Correlation and regression analysis of quantitative traits. Rank correlation coefficients
- **Topic 8.** Methods of processing qualitative data of pharmaceutical experiments

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Knowledge of STATISTICAL METHODS IN PHARMACY is the KEY to your SUCCESSFUL CAREER

- **in science**

- **as well as in business**

Statistical Methods in Pharmacy

It's my choice!