

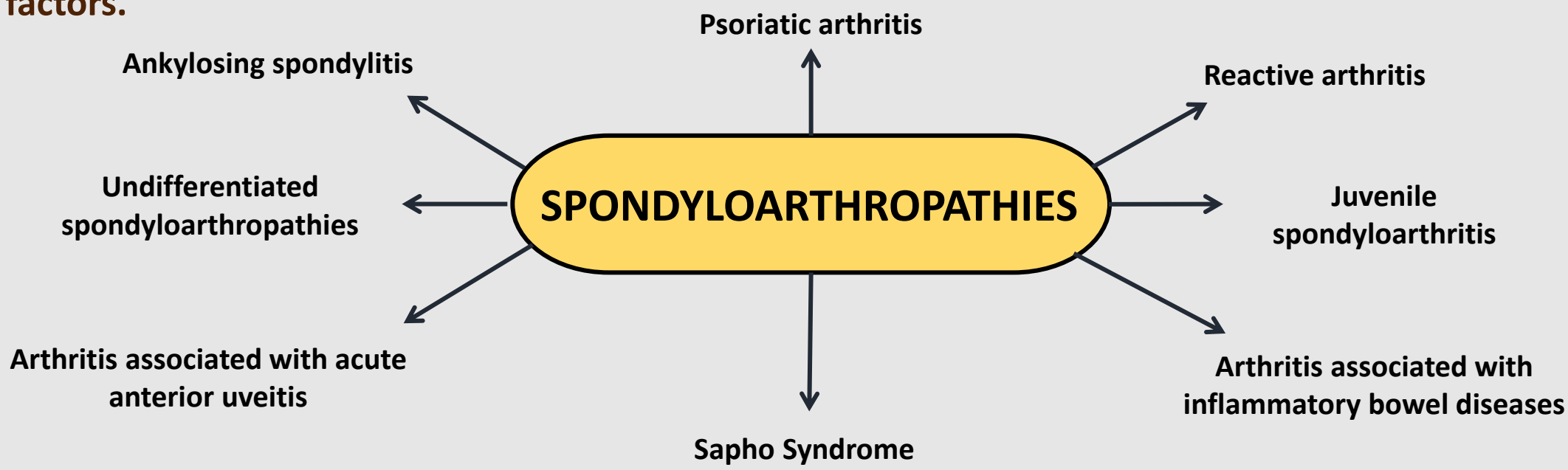
# ASSESSMENT OF THE PREVALENCE, DIVERSITY AND DRUG RESISTANCE OF FUNGI IN PATIENTS WITH SPONDYLOARTHROPATHIES IN RELATION TO THE SEVERITY OF THE DISEASE AND BIOLOGICAL MARKERS FOR SELECTED PATHOGENS.

Szymon Lis<sup>1</sup>, Katarzyna Górska<sup>2</sup>, Anna Lewandowska-Polak<sup>1</sup>

<sup>1</sup>Rheumatology Clinic, Chair of Pulmonology, Rheumatology and Clinical Immunology <sup>2</sup>Department of Biology and Parasitology, Chair of Biology and Medical Microbiology, Medical University of Lodz

## SPONDYLOARTHROPATHIES - DEFINITION

- The second most common group of inflammatory arthropathies.
- Diseases phenotypically different, although sharing common symptoms, pathogenesis and risk factors.



## Classification criteria for spondyloarthritis (SpA) according to ASAS (2010)

### Axial spondyloarthritis

- A) Sacroiliitis documented by imaging and  $\geq 1$  other features of SpA
- B) Presence of HLA-B27 antigen and  $\geq 2$  other features of SpA

- Features of SpA:
- Inflammatory low back pain
  - Peripheral arthritis
  - Adhesitis
  - Uveitis
  - Finger inflammation
  - Psoriasis
  - Crohn's disease or ulcerative colitis
  - Good response to NSAIDs
  - Family history of SpA - HLA-B27
  - Increased serum CRP levels

### Peripheral spondyloarthritis

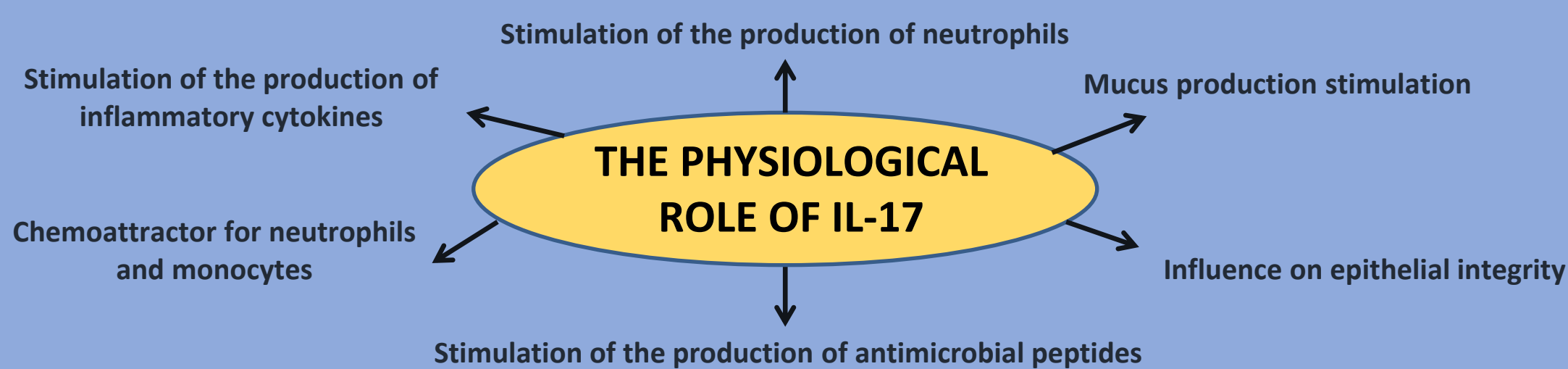
Inflammation of the joints or entheses or fingers, and:

- $\geq 1$  of the following SpA features:
- Uveitis
  - Psoriasis
  - Crohn's disease or ulcerative colitis
  - Pre-infection
  - HLA-B27
  - Sacroiliitis on imaging

- $\geq 2$  of the following SpA characteristics:
- Arthritis
  - Enthesitis
  - Finger inflammation
  - Inflammatory low back pain (ever)
  - Family history of SpA

## INTERLEUKIN 17, MYCOSES AND SPONDYLOARTHROPATHIES

- Interleukin 17 is a group of cytokines: IL-17A, IL-17B, IL-17C, IL-17D, IL-17F
- IL-17A inhibitors are used in the treatment of AS and PsA: secukinumab and ixekizumab



- In animal studies, exposure to *Candida albicans* resulted in increased joint deterioration, bone erosion and cartilage damage.
- *C. albicans* has been shown to increase the production of IL-17
- It was also observed that the percentage of Th17 lymphocytes increased in the synovial fluid
- Studies in animal models have also shown the role of zymosan, beta-glucan and mannan
- Exposure of susceptible mice to *C. albicans* only did not result in disease symptoms

## C. ALBICANS AND ANKYLOSING SPONDYLITIS

- Having a *Candida albicans* infection causes a 1.77-fold increase in the risk of developing AS within 6 years from the first diagnosis.

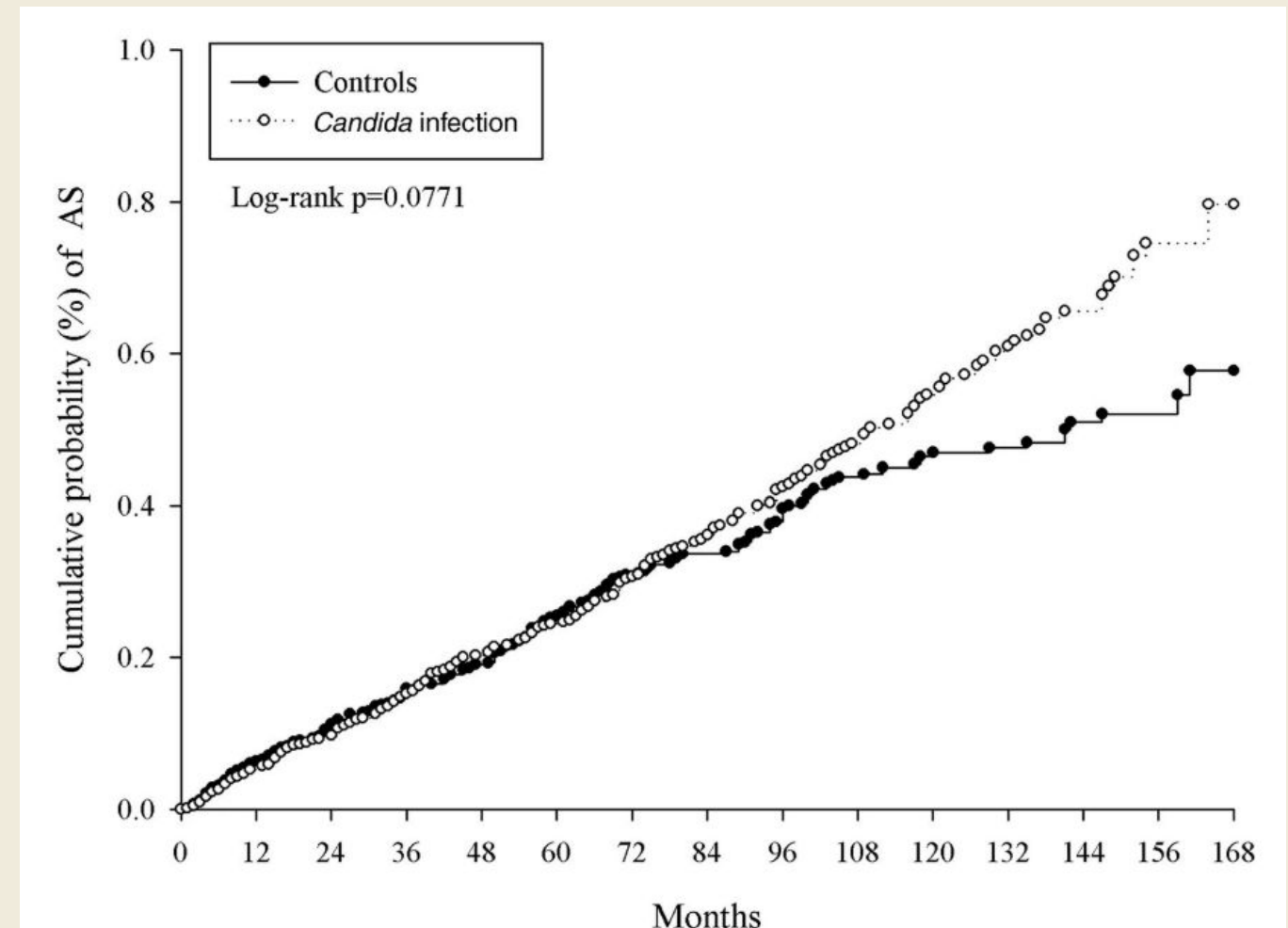
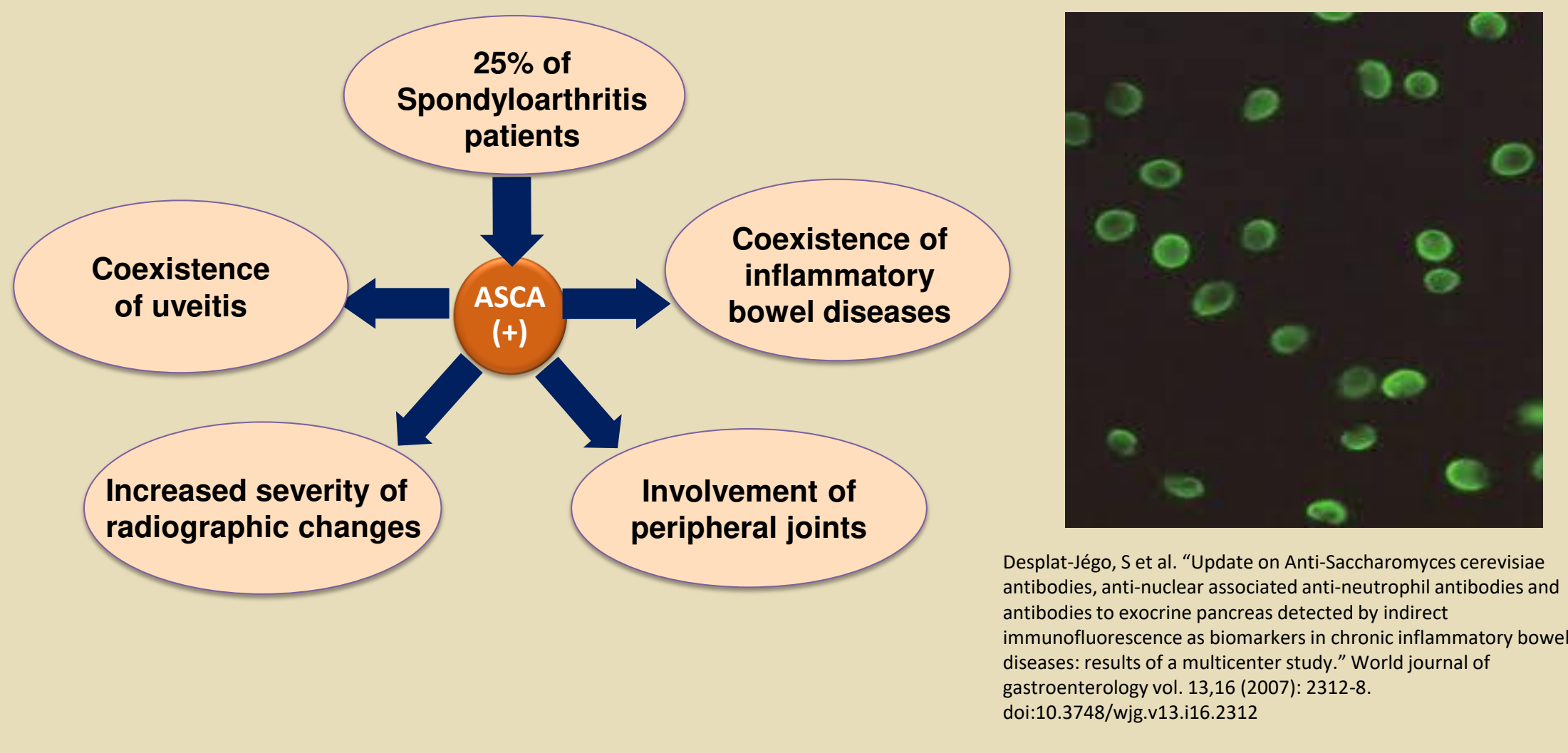


Figure 2. The cumulative incidence of ankylosing spondylitis for the patients with and without *Candida* infection.

Wei, J. C. C., Chou, M. C., Huang, J. Y., Chang, R. & Hung, Y. M. The association between *Candida* infection and ankylosing spondylitis: a population-based matched cohort study. *Curr. Med. Res. Opin.* 36, 2063–2069 (2020).

## ANTI-SACCHAROMYCES CEREVISIAE ANTIBODIES IN PATIENTS WITH SPONDYLOARTHROPATHIES



## RESEARCH OBJECTIVES

The aim of the study is to assess:

- Occurrence and diversity of fungi in patients with spondyloarthropathies
- Drug resistance of fungal strains isolated from patients with spondyloarthropathies compared to wild strains.
- Expression of drug resistance genes with fungal strains isolated from particular groups
- Concentrations of biomarkers characteristic for fungi in patients with spondyloarthropathies
- The impact of mycobiotic diversity and the presence of fungal biomarkers on the activity of the disease and the severity of joint changes.
- Differences in the frequency and diversity of mycobiotics between patients with spondyloarthropathies treated and not treated with IL-17 inhibitors.

## STUDY GROUPS

Study group No. 1, n = 60	Study group No. 2, n = 20	Control group, n = 40
Patients meeting the criteria for the diagnosis of spondyloarthritis (ASAS criteria, 2010), without coexisting systematic autoimmune disorders other than psoriasis and inflammatory bowel diseases	Patients meeting the criteria for the diagnosis of spondyloarthritis (ASAS criteria, 2010), without coexisting systematic autoimmune disorders other than psoriasis and inflammatory bowel diseases and treated with biological drugs directed against IL-17	Volunteers without any systematic autoimmune diseases matched to the recruited patients in terms of gender, age and chronic diseases

## METHODS

1. Patients and healthy volunteers will be clinically assessed by a doctor
2. Collection of biological material from the participants of the study
3. Processing of the collected material and identification of fungi
4. Assessment of drug resistance and expression of drug resistance genes in isolated fungi
5. Molecular tests for biomarkers characteristic for fungi in the peripheral blood
6. Investigation of IL-17A concentration
7. Analysis of research results, statistical data processing

## EXPECTED THERAPEUTIC AND COGNITIVE BENEFITS OF THE STUDY

The study will:

- Help improve our understanding of the pathogenesis of spondyloarthritis.
- Assess the impact of mycobiotics on disease activity indicators and the progression of joint lesions in spondyloarthropathies.
- Identify potential pathogens and their drug resistance in fungal infections in patients with spondyloarthropathies.
- Assess whether treatment with IL-17 inhibitors has an impact on the incidence and diversity of mycobiotics in patients with spondyloarthropathies.
- Assess whether there is a relationship between IL-17A concentration and *IL-17A* gene expression and mycobiotic differentiation in patients with spondyloarthropathies.

## MY ACHIEVEMENTS THIS YEAR

- The prepared chapter „Zmiany w obrębie ręki w przebiegu RZS” for the post-conference script - „Co w stawie trzeszczy? O nadgarstku od podstaw”. The book remains in the editorial office.
- Original work - "Cell pleomorphism and changes in the enzymatic profile of selected *Candida albicans* strains in interaction with *Escherichia coli* - pilot study" - Currently awaiting publication.
- Acquiring practical teaching skills
- Acquiring useful skills in the profession of a scientist in the course of classes