Microbiota Research in Kalisz
Welcome & Introduction

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Kalisz, Poland

Welcome and Introduction

- A warm welcome to all visitors of the website of the Microbiota Research Team in Kalisz.
- This presentation is aiming to give you an overview about what our research team has done, is doing and is planning to do. You will also find some background information about our research and why we think it is relevant.
- We are trying to update this presentation on a regular basis so that it is representing the actual status of our research work. However, as things are changing fast, some of the information might have become already outdated. Please don’t hesitate to contact us, to be provided by the latest status by one of the team members.
- The website is our platform for making our research transparent and accessible. Our policy is to publish our results in peer-reviewed scientific journals as open access manuscripts. Thereby you can easily and cost-free access our publications, presentations and webinars by scanning the QR-codes which you will find throughout our website, alternatively click on the respective download buttons.
- Research progress is based on an open-minded exchange of ideas. You are more than welcome to send us your suggestions, feedback and questions. Please use the contact form and we will try to respond to you on short notice.

The Coreteam

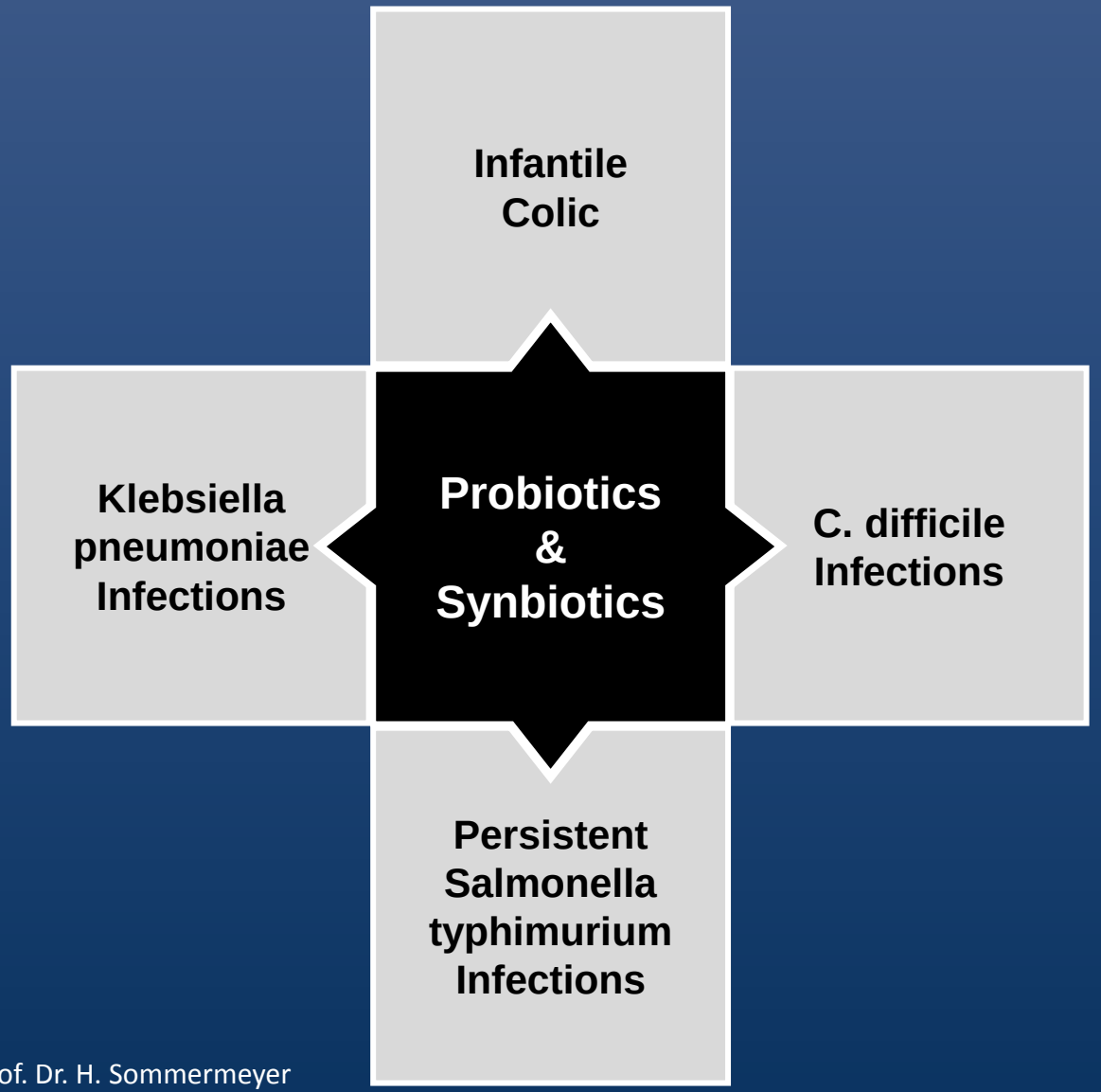
Prof. Dr. Jacek Piatek

Prof. Dr. Henning Sommermeyer

Prof. Dr. Hanna Krauss

Gut-Microbiota Research Kalisz, Poland: Our Focus Areas

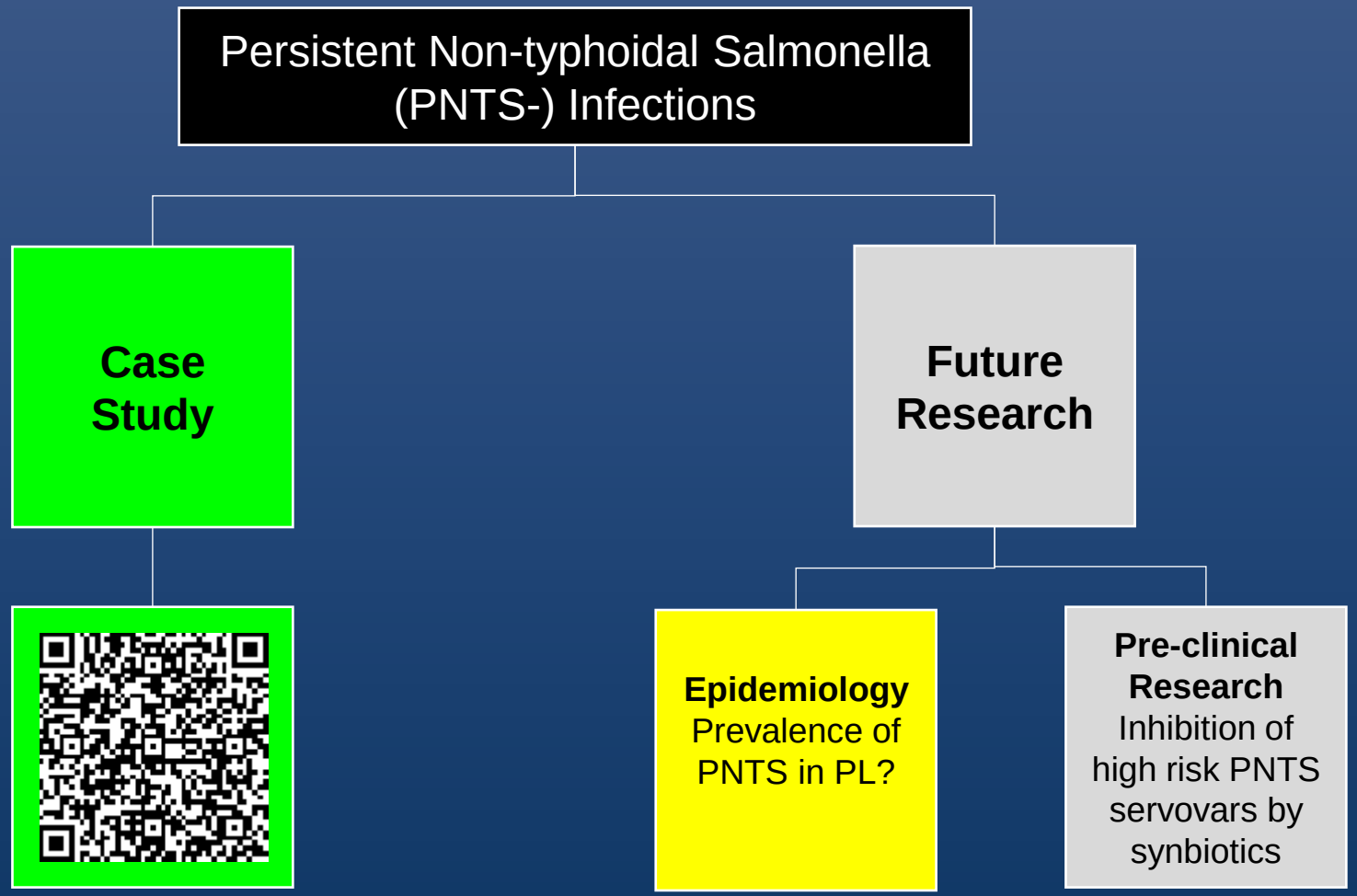
Kalisz, Poland



Introduction – Persitent Salmonella Typhimurium Infections

- *Salmonella enterica* is a gram-negative, anaerobe, facultative intracellular human and animal pathogen posing a major public health concern worldwide.
- Non-typhoidal serovars (NTS), e.g., *S. typhimurium, S. enteritidis,* normally cause self-limited gastroenteritis, associated with intestinal inflammation and diarrhea that lasts for 5-7 days in immunocompetent individuals.
- In contrast to the well-documented cases of prolonged infections by *S. typhi*, persistent NTS infections are far less studied and the prevalence of long-term NTS carriers in the population is not known.
- In a recently published study performed in Israel (Marzel et al., 2016), it was found that at least 2.2% of all confirmed NTS infections resulted in prolonged infections. The persistence periods in the 1,047 cases analyzed in the study ranged from 30 days to 8.3 years.
- These findings provide important clinical and public health implications, as the long-term NTS carriers possibly serve as a human reservoir for NTS transmission.
- Identification of these patients and successful treatment of their *Salmonella* infection is desirable to contain the spread of NTS to a broader part of the population and limit the healthcare expenditures related to caregiving of patients with persistent NTS.

Persistent Salmonella Typhimurium Infections – Research Program

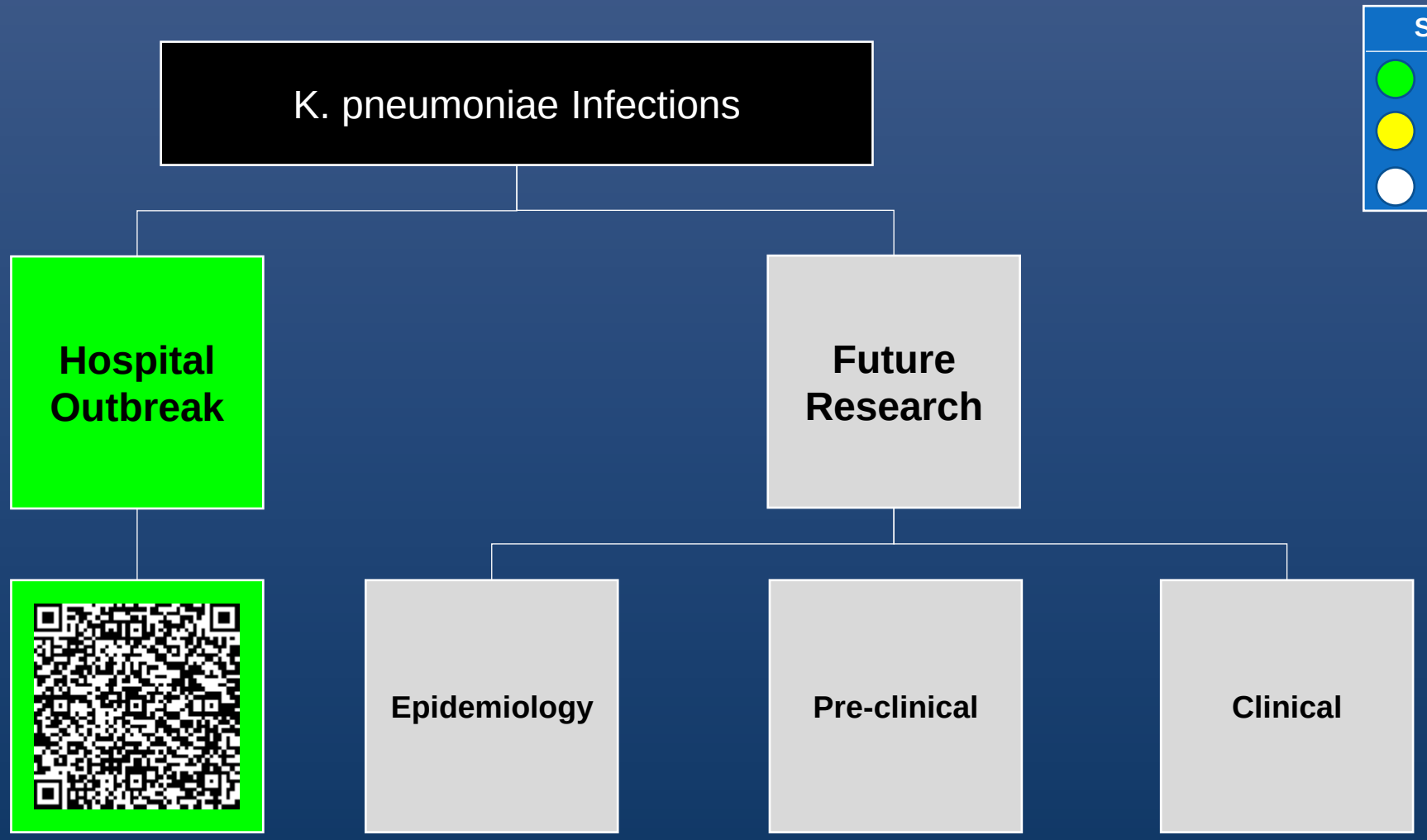


Status
- done
- ongoing
- planned

Introduction – NDM-1 Klebsiella Pneumoniae Infections

- Extended spectrum-ß-lactamase- (ESBL-) producing, and carbapenem-resistant *K. pneumoniae strains*, are spreading at an alarming rate.
- *K. pneumoniae* is a gram-negative bacteria that is frequently isolated from samples collected from ICU patients and accounts for nearly 12% of all hospital acquired pneumoniae.
- Carbapenems (e.g. imipenem or meropenem) represent the firstline therapy for severe infection by ESBL-producing *K. pneumoniae*.
- However, *K. pneumoniae* isolates resistant to carbapenems have been reported and prevalence of carbapenem-resistant *K. pneumoniae* (CRKP) has increased rapidly.
- There is no optimal treatment for CRKP. Treatment options include antibiotics from the polymyxin class, tigecycline, fosfomycin, aminoglycosides or dual therapy carbapenems.
- As *K. pneumonia* is becoming resistant against more and more antibiotics, non-antibiotic strategies have to be considered for the management of infections with this pathogen.
- Probiotics and synbiotics are discussed as alternative treatment or adjuvant therapy for infections with multidrug resistant K. pneumoniae.

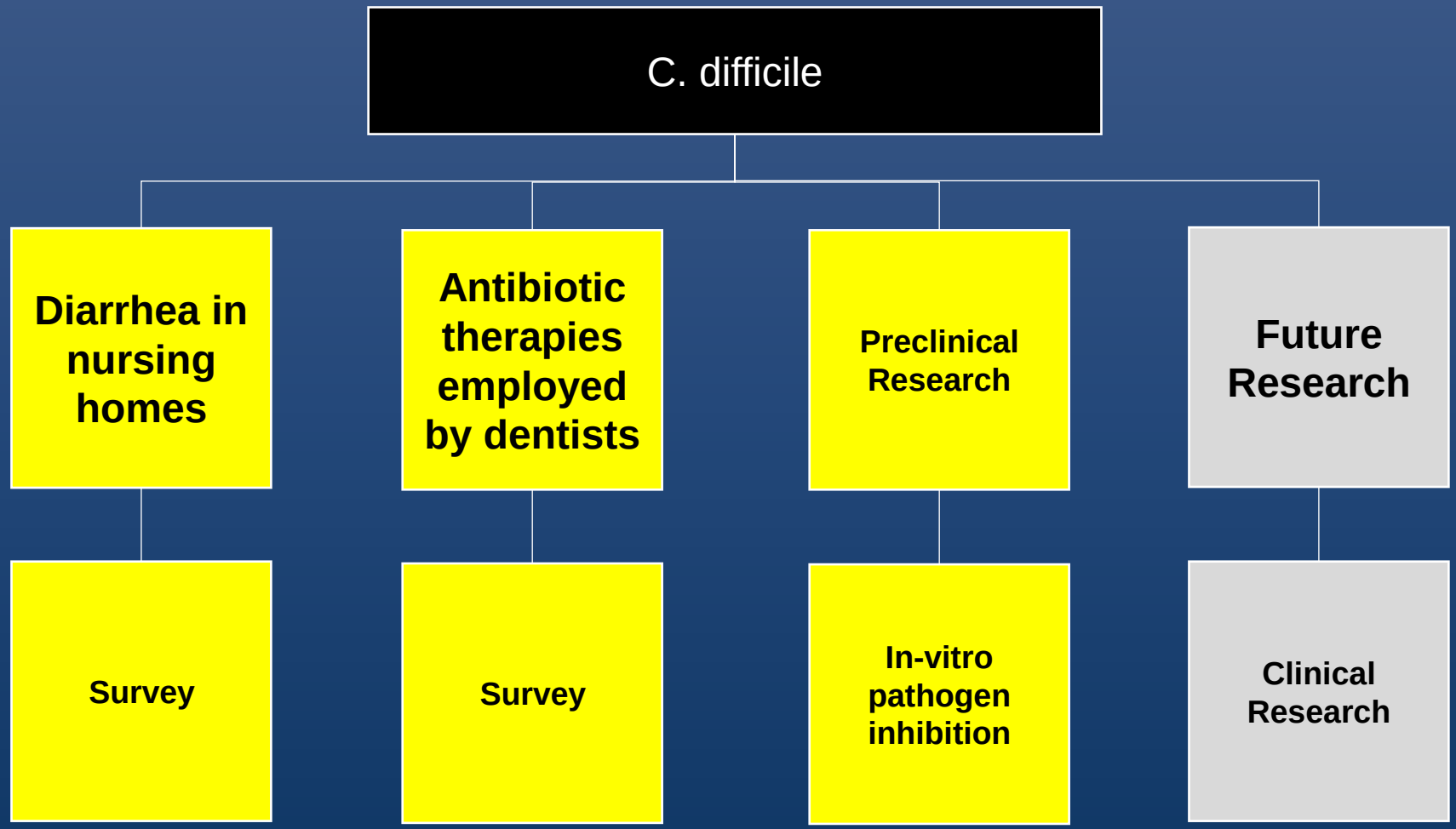
K. pneumoniae Infections – Research Program



Introduction – Clostridioides difficile Infections

- C difficile infections (CDI) have seen a strong increase during the last three decades. Interestingly enough, this growth has been fueled mainly by the increased usage of broad-spectrum antibiotics.
- While encountering a C. difficile-related medical challenge previously may have been most common in a hospital setting, it has now also become increasingly common in community-based healthcare settings.
- Exposure to healthcare is one of the major risk factors of CDI. Lack of preventative activities (e.g., lack of appropriate hygiene measures fighting C. difficile spores), as well as certain actions by healthcare providers (e.g. prescribing antibiotics) can both trigger CDI.
- Being a healthcare-made problem of the healthcare system makes it mandatory for physicians and other healthcare providers to establish a good understanding of the problem and the currently existing possibilities to manage it.
- Administration of probiotics or synbiotics is discussed as measure to strengthen the colonization resistance of the gut-microbiota and thereby limit the risk of overgrowth of the gut by C. difficile.

C. difficile – Research Program



Introduction – Infantile Colic

- Infantile colic is defined by Wessel's "rule of 3s," crying or fussing of otherwise healthy newborns for more than three hours per day for more than three days per week for three weeks.
- Published occurrence rates of infantile colic vary widely, from 3 to 40% depending on details of diagnostic criteria. Infantile colic often begins at around 2 weeks of age, peaks at 6–8 weeks and largely subsides by 3–4 months of age.
- Although infantile colic is a self-limiting condition, it is a major burden for the baby, the family, health professionals and the health care system. Due to its stressful nature, infantile colic is among the leading causes why parents consult a healthcare professional during early infancy.
- Pediatricians employ a variety of pharmacological and non-pharmacological approaches for the management of colicky babies. Not all of them are supported by evidence based scientific data.

Infantile Colic – Research Program

Status
- done
- ongoing
- planned

Infantile Colic

Survey
Pediatricians (D/PL)

Preclinical Study
(In-vitro Pathogen Inhibition)

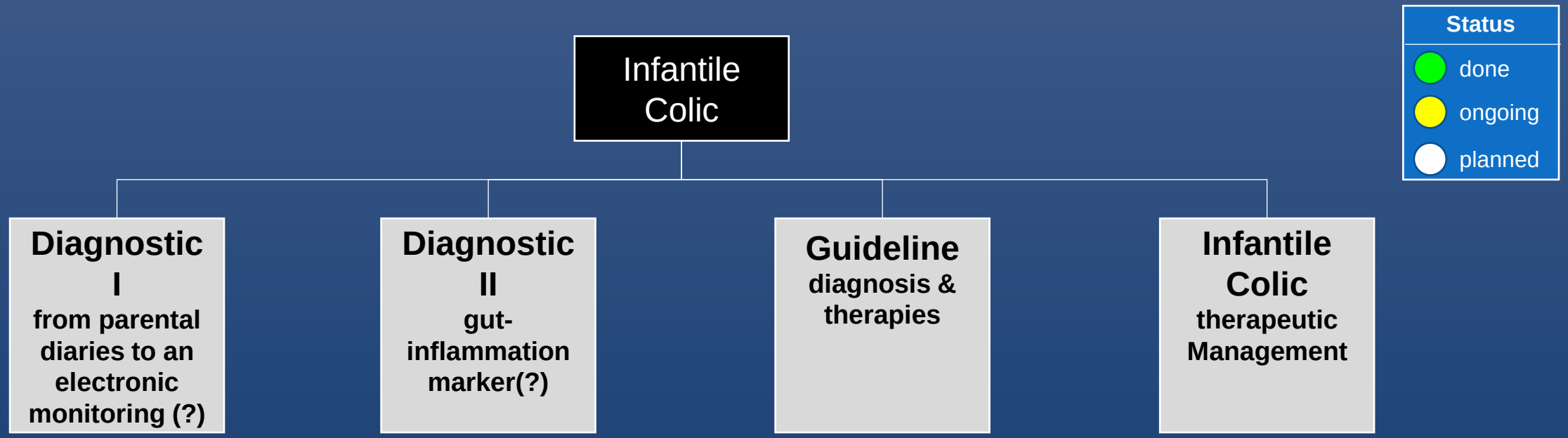
Clinical Study I
Crying Simethicone vs. Synbiotic

Under peer review for publication

Clinical Study II
Gut-inflammation Simethicone vs. Synbiotic

Work in progress

Infantile Colic – Research Program
Objectives of the Future



Questions, Comments & Suggestions

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