

ROADMAP 101 Warm-up: An Introduction to PSC Concepts and Terminology

PSC is a complicated disease with lots of medical and scientific jargon and complex concepts that are challenging to understand. Through the ROADMAP Research series, we can learn together and build a common language to discuss research needs for PSC.

Our PSC Voices will enhance research and drug development.

During the ROADMAP 101 session on August 11th, Dr. Heather Francis will provide us with some basic terminology and concepts across FIVE aspects of PSC. Because science is such a foreign language to many of us, the Research 101 session will be an opportunity to hear, read, and speak new terms. Together, we will learn to ask questions of the experts.

To get us started, PSC Partners put together this document with a glossary of terms and background information about each of these five aspects of PSC.

Five Aspects of PSC we'll learn about during the Research 101:

1. Biology of PSC
2. Genes
3. Microbiome
4. Bile
5. Immunology



Glossary of Terms for the Five Aspects of PSC:

1. Biology of PSC:



Primary Sclerosing Cholangitis (PSC) - a rare and complex chronic bile duct disease that results in damage to the bile ducts inside and outside the liver. These processes lead to inflammation and fibrotic scarring and ultimately may progress to cirrhosis, requiring liver transplant. PSC is a complicated disease and likely results from interactions between genetic, autoimmune, and environmental mechanisms.

Fibrosis - scarring of the liver tissues when the liver tries to repair and replace damaged or inflamed cells. Scar tissue does not work as well as healthy liver tissue.

Stricture - an abnormal narrowing of a body passage, especially a tube or canal like the bile duct, which can slow or obstruct the flow of body fluids. Inflammation, cancer, or scar tissue may cause a stricture.

Cholestasis - reduction or stoppage of bile flow. Disorders of the liver, bile duct, or pancreas can cause cholestasis, as can certain medications.

Cirrhosis - a late stage of scarring (fibrosis) of the liver caused by many forms of liver disease, including PSC.

Research – systematic and continued investigation to identify new information, facts, and understanding from existing knowledge through observation and experimentation.

2. Genes



Genes - the basic unit of heredity, containing the code, or set of instructions, for specific proteins throughout the body to control the structure and function of the body. Genes are part of deoxyribonucleic acid (DNA) and are housed in each cell.

Genetics - the scientific study of heredity or biological inheritance, including the passing of genetic information or traits from one generation to the next.

Variant - a small variation in the genetic code, which is what makes everyone different, such as eye color. Most variations do not cause problems and are called benign variants. A pathogenic variant or mutation may cause a gene to not work properly or cause harm, such as an increased chance of developing a certain disease or disorder.

HLA Genes – the human leukocyte antigen (HLA) genes encode proteins that influence how our immune system recognizes and responds to potential threats in our bodies. These HLA proteins may be involved in many autoimmune diseases, including PSC. For example, while there are thousands of different HLA genes, PSC patients tend to share a few in common.

Genotype - the set of genes that make up a cell, an individual, or an organism. Genotype can also refer to a particular gene or set of genes carried by an individual.

Phenotype - the observable physical characteristics or traits that result from the interaction of the genotype (set of genes responsible for a trait) with the environment, such as height, eye color, overall health, disease history, and behavior.

3. Microbiome



Microbiome/Microbiota - the human microbiota consists of the 10-100 trillion symbiotic (involving beneficial or harmful interaction among cells) microbial cells harbored by each person, primarily bacteria in the gut; the human microbiome consists of the genes that live in these cells.

Fecal microbiota transplant (FMT) - the procedure in which stool from a healthy donor is placed into the gut of a patient in order to treat some conditions. This procedure is typically done via colonoscopy.

Inflammatory bowel disease (IBD) - an umbrella term used to describe disorders that involve chronic inflammation of the digestive tract, such as ulcerative colitis and Crohn's disease. Symptoms of IBD can include severe diarrhea, bloody stools, abdominal pain, fatigue, and weight loss.

Crohn's Disease – a type of inflammatory bowel disease, Crohn's most commonly affects the end of the small bowel (the ileum) and the beginning of the colon, but it may affect any part of the gastrointestinal (GI) tract.

Ulcerative colitis - an inflammatory bowel disease that causes long-lasting inflammation and sores (ulcers) in the innermost lining of the large intestine (colon) and rectum. PSC is often associated with ulcerative colitis.

4. Bile



Bile - a liquid made by the liver, containing water, cholesterol, bile acids, electrolytes, and waste products such as bilirubin. Bile is stored in the gallbladder and passes through the bile ducts into the intestine where it helps digest fat. If bile acid levels are high, e.g., with cholestasis, they can damage the liver cells.

Bile acids - bile contains bile acids, made by the liver, to help break down and absorb fats. There are many different bile acids present in our bile.

Bile ducts - the tube-like structures that carry bile from the liver to the intestines.

Biliary system - also called biliary tree or biliary tract, refers to the liver, gallbladder, and bile ducts which create, move, store, and release bile into the small intestine.

5. Immune system



Immune system – our immune system is a collection of specialized cells tasked with protecting our bodies from injury and foreign invaders like bacteria and viruses. When the immune system isn't functioning properly, this can lead to cancer or autoimmune diseases.

Immunology – the study of tissues, cells, and molecules to understand both how the immune system functions normally and how it can go wrong in the context of chronic inflammation, autoimmune disease, and cancer.

Autoimmunity – this is a process that occurs when our body responds to our own tissues instead of responding to foreign invaders like bacteria and viruses. Diseases where our immune system attacks and damages our own tissues are autoimmune diseases.

Inflammation – this process occurs when our immune system becomes activated. Think of the hot, red, swollen response we sometimes see after getting cut. Inflammation helps to protect us from infection, but if it is not properly tuned and controlled, inflammation can result in damage to our tissues.

Immunomodulators - medications that help regulate or normalize the immune system, such as azathioprine, methotrexate, or sulfasalazine.

Immunosuppression – this is a state where the body's immune system is dampened, with a reduced ability to induce inflammation and fight infection. In the context of PSC, the body's immune system may be suppressed to help the body accept an organ that has been transplanted. Immunosuppression may also result from some diseases or medications.