

## 1.1 Pubmed

My topic is the CKD (Chronic Kidney Disease). I searched for “CKD” in pubmed.

Firstly, without any filters applied, the total number of results is 37,614. If I apply the filter for the text availability “Abstract” the number of results decreases to 36,259. Now I apply the filter on publication date and set it to 5 years. In the last five years there were 18,023 papers published about CKD that have a text availability of “Abstract”. If I set the publication date to 10 years, the number of results increases to 29,268.

I should answer the following questions:

- What is the randomized controlled trial? How many results are shown after filtering with this parameter?
  - o A randomized controlled trial is a study design where randomly assigns participants into an experimental group or a control group. As the study is conducted, the only expected difference between the control and experimental groups in a randomized controlled trial is the outcome variable being studied. If I filter by the article type “Randomized Controlled trial” the number decreases to 1,139 results in the past 10 years.
- How could you optimize your search further?
  - o I could optimize my search further by applying further filters like the species which participated in the trial (Human or other Animals), the sex, the age or I could filter by the journal where it has been published. Furthermore, I could add additional key words to shrink the outcome.

Next, I should pick 4 abstracts and answer the following questions (to be able to answer these questions I must minimize the outcome by changing the input from “CKD” to “CKD genetics”. The reason to change the input is because of question three.):

- What was the goal?
  - o PMID: 34032717: The aim of this study is to investigate the effectiveness of zolpidem 10 mg and acupuncture therapy on foot acupoints to improve the sleep quality and overall quality of life among hemodialysis patients suffering from CKD-aP.
  - o PMID: 31598912: The aim of the study is to see if a treatment of metabolic acidosis with sodium bicarbonate improves kidney and patient survival in CKD.
  - o PMID: 33564816: This study investigates the effects of macronutrient intake ratios on the risk of CKD.
  - o PMID: 30314978: This study aimed to know the impact of Empagliflozin and how it slows down the progression of CKD in patients with type 2 diabetes and cardiovascular diseases.
  - o PMID: 26430087: This study aimed to identify factors that contribute to heterogeneity in case of the apolipoprotein L1 (APO1) and an increased risk of progressive CKD.
- What methods were used?
  - o PMID: 34032717: It was a multicenter, prospective, randomized, parallel-design, open label interventional study. The study has two groups. One group uses zolpidem (10mg) and the other gets acupuncture.

- PMID: 31598912: A randomized (ratio 1:1), open-label, controlled trial was conducted.
- PMID: 33564816: It was an observational cohort study that was mainly based on the UK Biobank incl. MR analysis.
- PMID: 30314978: Three randomized groups (ratio 1:1:1) were created, where in one group 10 mg/d, 25mg/d and a placebo were given.
- PMID: 26430087: A multivariable Cox model was used and data from 693 participants in the African American Study of Kidney Disease and Hypertension was analyzed to identify factors that modify the association between APOL1 genotypes and CKD progression.
- What genes are reported to be related to your topic?
  - PMID: 34032717: None.
  - PMID: 31598912: None.
  - PMID: 33564816: None.
  - PMID: 30314978: None.
  - PMID: 26430087: APOL1

## 1.2 GenBank

- What is the accession number?
  - The accession number is a unique identifier that consists of a sequence and its annotations.
- What are orthologs?
  - Orthologs are genes that are related by vertical descent from a common ancestor and encode proteins with the same function in different species.
- Query GenBank with the names of genes found from your research. Look for nucleotides.
- For each gene (1):
  - Which chromosome is it located on?
    - It is located on Chromosome 22
  - What is its position?
    - NC\_000022.11
  - Which species were reported to have this gene?
    - Homo Sapiens
  - What molecular functions and biological processes is the gene involved in?
    - Enables chloride channel activity; enables lipid binding; enables protein binding; involved in chloride transmembrane transport; cholesterol metabolic process; cytolysis by host of symbiont cells; innate immune response; lipid transport; lipoprotein metabolic process
  - What is known about the protein family the sequence codes for?
    - Protein or apolipoprotein associated with High-Density Lipoproteins (HDL), a class of proteins involved in lipid (cholesterol, phospholipids and triacylglycerol) metabolism in the body fluids. HDL are formed in the liver and are involved in reverse cholesterol transport, the transport of cholesterol from peripheral tissues to the liver. Apolipoproteins are proteins which are specifically associated with lipoproteins, which is not the case for all the proteins associated with HDL or with the other lipoprotein classes.