

F2F Meeting

16-09-24

Sections of the literature review

1. Type 2 diabetes Mellitus
2. Prediabetes / metabolic syndrome
3. Current pharmacological interventions
4. Brown seaweed extract as a compound for alleviating prediabetes
5. The Intestinal Epithelium / diabetic gut
6. Multi-omics / scRNA seq for unveiling novel metabolic information
7. Using mouse models for studies on T2DM
8. Pathways of interest for the study (Insulin signalling pathway, tight junction, carbohydrate/fatty acid metabolism, cell fate, proteasome, spliceosome)

Updates on the literature review

- Produced a draft on Friday 13th
- Structure needed serious revising and refocussing on literature relevant to the project
- 13th – 17th/18th refocussing the literature review.
- Details in the next slides

Literature Review Structure (Before)

- Structure originally consisted of 4 chapters

Chapter 1. The global epidemic of metabolic disease. Prediabetes and Diabetes

Type 2..... 1

1. Type II Diabetes Mellitus.....1

Risk Factors.....1

Diagnoses.....5

Management of T2DM.....5

Complications of T2DM.....5

2. Prediabetes and Metabolic Syndrome.....5

Defining Prediabetes.....5

Prediabetes Pathologies.....6

- Chapter 1 had too much detail about T2DM and Prediabetes (8 pages)
- Chose to condense important relevant details into an introductory paragraph in the lit review.

Literature Review Structure (Before)

Chapter 2: The intimate link between the intestinal epithelium and prediabetes. 8

3. The Intestinal Epithelium in Metabolic Health and Disease.....	8
Structure and function of the intestinal epithelium.....	8
Alterations in intestinal epithelium during prediabetes.....	9
Gaps in current knowledge.....	10
4. Key Signalling Pathways in Intestinal Epithelial Cells and Prediabetes.....	10
Intestinal Stem Cells.....	10
Enterocytes.....	10
Goblet Cells.....	12
Enteroendocrine Cells.....	13
Paneth Cells.....	14

- The structure previously focussed on a cell to cell level, missing relevant larger ideas in the literature

Literature Review Structure (Before)

Chapter 3: Interrogation methods for revealing alterations in the metabolic disease state.....	14
5. Multi-omics Approaches in Prediabetes & T2DM Research.....	14
Transcriptomics and scRNA-seq.....	14
Genomics.....	15
Proteomics.....	15
Metabolomics.....	16
Integrating Multiple Omics Techniques.....	16
Applications.....	16
6. Mouse Models in Prediabetes Research.....	16
Diet-Induced Models.....	16
Chemical/Drug-Induced Models.....	17
Genetic Modifications.....	18

- Too much detail on multiomics, not enough detail on scRNA-seq describing why I am choosing the methods I am using.

Literature Review Structure (Before)

Chapter 4: The potential for synthetic and natural pharmacological agents in reversing metabolic dissarray.....	19
7. Current Pharmacological Interventions for Prediabetes and T2DM.....	19
8. Emerging Therapies: Focus on Brown Seaweed Extract.....	19

- This section remains in the literature review although I am finding it hard to connect it to my project ...

Literature Review Structure (Now)

Introduction.....	1
Chapter 1: The intimate link between the intestinal epithelium and prediabetes.....	2
Intestinal Barrier Structure and Function.....	2
Microbiota.....	3
Mucus Layer.....	4
Intestinal Epithelium.....	4
Immune Barrier.....	5
Modifiers of the Intestinal Barrier.....	6
Intestinal Epithelium Alterations in prediabetes.....	8
Microbiota Alterations.....	8
Intestinal Permeability.....	10
Inflammation.....	12
Intestinal Stem Cell Function Alterations.....	16

- Literature Review now 3 chapters

Literature Review Structure (Now)

Chapter 2: scRNA-seq and modelling approaches for revealing alterations in the prediabetic disease state.....	18
2.1 single cell RNA-sequencing.....	18
2.3 Mouse Models in Prediabetes Research.....	21

- Refocussed on scRNA-seq, upstream / downstream techniques

Literature Review Structure (Now)

Chapter 3: The potential for synthetic and natural pharmacological agents in reversing metabolic dissarray.....	24
3.1 Current Pharmacological Interventions for Prediabetes and T2DM.....	24
3.2 Emerging Therapies: Focus on Brown Seaweed Extract.....	24

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Problems

- Unsure how chapter 3 fits into the project

Timeline

- 17th / 18th first complete draft
- Sunday 22nd results / methods complete
- Saturday 28th Final Draft complete