MSc Precision Medicine: Pre-arrival Reading List

This reading list supports each taught unit on the MSc Precision Medicine. You don't need to read everything before you arrive start with whichever areas interest you most. Some journal articles may require University login, which you'll receive after registration.

Taster reading for MSc Precision Medicine

We recommend starting with these two short papers that set the scene for the whole programme:

Stark Z, Dolman L, Manolio TA, Ozenberger B, Hill SL, Caulfied MJ, Levy Y, Glazer D, Wilson J, Lawler M, Boughtwood T, Braithwaite J, Goodhand P, Birney E, North KN. Integrating Genomics into Healthcare: A Global Responsibility. Am J Hum Genet. 2019 Jan 3;104(1):13-20. doi: 10.1016/j.ajhg.2018.11.014. PMID: 30609404; PMCID: PMC6323624.

Collins FS, Varmus H. A new initiative on precision medicine. N Engl J Med. 2015 Feb 26;372(9):793-5. doi: 10.1056/NEJMp1500523. Epub 2015 Jan 30. PMID: 25635347; PMCID: PMC5101938.

Genetics & Genomics Unit

Websites

National Human Genome Research Institute (NHGRI), Education pages: http://www.genome.gov/10001772
The Human Genome Project Fact sheets: https://www.genome.gov/about-genomics/fact-sheets

PHG Foundation: phgfoundation.org

Papers

Malone ER, Oliva M, Sabatini PJB, Stockley TL, Siu LL. Molecular profiling for precision cancer therapies. Genome Med. 2020 Jan 14;12(1):8. doi: 10.1186/s13073-019-0703-1. PMID: 31937368; PMCID: PMC6961404.

Books

Genetics and Genomics in Medicine
Author(s):Tom Strachan, Anneke Lucassen ISBN: 9780367490812
Published 22 July 2022, 2nd edition

Proteomics & Metabolomics Unit

Websites

https://www.ebi.ac.uk/training/online/courses/metabolomics-introduction/

Papers

Trivedi DK, Hollywood KA, Goodacre R. Metabolomics for the masses: The future of metabolomics in a personalized world. New Horiz Transl Med. 2017 Mar;3(6):294-305. doi: 10.1016/j.nhtm.2017.06.001. PMID: 29094062; PMCID: PMC5653644.

Geyer PE, Holdt LM, Teupser D, Mann M. Revisiting biomarker discovery by plasma proteomics. Mol Syst Biol. 2017 Sep 26;13(9):942. doi: 10.15252/msb.20156297. PMID: 28951502; PMCID: PMC5615924.

Books/ebooks

The Functions of Proteins Are Determined by Their Three-Dimensional Structures. Nature. Primer (http://www.nature.com/scitable/ebooks/essentials-of-cell-biology-14749010/122996920#bookContentViewAreaDivID).

Proteins Are Responsible for a Diverse Range of Structural and Catalytic Functions in Cells. Nature. Primer (http://www.nature.com/scitable/ebooks/essentials-of-cell-biology-14749010/122996980#bookContentViewAreaDivID).

Research Methods Unit

Research in precision medicine encompasses a diverse range of impactful tasks - from discovering life-changing drugs and identifying key biomarkers, to estimating causal treatment effects and evaluating how targeted therapies can truly enhance patients' quality of life.
To thrive in this fast-moving landscape, it's essential to master a broad set of research methodologies and study designs. This strong foundation will help you generate robust collect robust data to answer specific research questions.

Websites
Zarrouki, B. and Liljeblad, M. (2023) "Precision medicine and genetically-validated targets reveal new opportunities for NASH therapies". AstraZeneca https://www.astrazeneca.com/what-science-can-do/topics/next-generation-therapeutics/precision-medicine-NASH.html#!

Lindén, D. and Romeo, S. (2022) "Novel genetic targets for fatty liver disease". AstraZeneca https://www.astrazeneca.com/what-science-can-do/topics/disease-understanding/novel-genetic-targets-for-fatty-liver-disease.html#!

Books
1) Heaslip and Lindsay (2019). *Research and Evidence-Based Practice: For nursing, health and social care students*. Lantern Publishing Ltd, Banbury.
   Recommended reading: the following sections in Part I:
   1. Identifying the research aim
   2. Reviewing the literature
   3. Designing a study
   7. What do we know now? Communicating research findings

2) Laber, E., Chakraborty, B., Moodie, E.E.M., Cai, T. and van der Laan, M. (eds.) (2024). *Handbook of Statistical Methods for Precision Medicine*. 1st ed., New York: Chapman and Hall/CRC. doi:10.1201/9781003216223
   Recommended reading in Part I: Study Design for Precision Medicine, Pages 1–128.
   This part provides a comprehensive foundation in designing studies tailored for precision medicine.

<u>Laboratory Skills Unit</u>
Papers
Du M, Hou Z, Liu L, Xuan Y, Chen X, Fan L, Li Z, Xu B. [1]Progress, applications, challenges and prospects of protein purification technology. Front Bioeng Biotechnol. 2022 Dec 6;10:1028691. doi: 10.3389/fbioe.2022.1028691. PMID: 36561042; PMCID: PMC9763899.

Lentini L, Perriera R, Corrao F, Melfi R, Tutone M, Carollo PS, Fiduccia I, Pace A, Ricci D, Genovese F, Colige A, Delvenne P, Grimbacher B, Moutschen M, Pibiri I. A precision medicine approach to primary immunodeficiency disease: Ataluren strikes nonsense mutations once again. Mol Ther. 2025 Jul 2;33(7):3231-3241. doi: 10.1016/j.ymthe.2025.03.045. Epub 2025 Mar 28. PMID: 40158206; PMCID: PMC12266018.
Summary Overview
This paper integrates immunohistochemistry, RT-PCR, SDS-PAGE, and western blotting to investigate primary immunodeficiency diseases (PIDs), a group of inherited disorders affecting the immune system. Rather than focusing on cancer, the study applies these techniques to understand how specific genetic mutations in individual patients lead to variable clinical outcomes, which is central to the aims of precision medicine. By characterizing gene and protein expression profiles in patient samples, the researchers are able to identify molecular markers that could guide more accurate diagnosis and targeted therapy. This approach highlights precision medicine in a non-oncological context, using standard molecular biology techniques to link genotype to phenotype and inform personalised treatment strategies.

Chen Y, Zhou T, Zhou R, Sun W, Li Y, Zhou Q, Xu D, Zhao Y, Hu P, Liang J, Zhang Y, Zhong B, Yao J, Jing D. TRAF7 knockdown induces cellular senescence and synergizes with lomustine to inhibit glioma progression and recurrence. J Exp Clin Cancer Res. 2025 Apr 4;44(1):112. doi: 10.1186/s13046-025-03363-1. PMID: 40181456; PMCID: PMC11969748.
Summary Overview

This study identifies TRAF7 as a potential therapeutic target in glioma, a type of brain cancer. By showing how TRAF7 knockdown induces senescence and enhances chemotherapy effectiveness through regulation of KLF4, the research provides a molecular rationale for personalized treatment strategies. Patients with specific TRAF7 or KLF4 expression profiles could potentially benefit from tailored therapies that combine gene targeting with standard chemotherapy, aligning directly with the goals of precision medicine by targeting the right treatment to the right patient based on molecular characteristics.