

# MED YSP 2025 Module 2: Pharmacology and Toxicology

Name: \_\_\_\_\_

| Monday, July 14, 2025                              |  |
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| Drugs and the Body                                 |  |
| Time   | Activity   |
| 8:00 - 8:45  | Check-in<br>David Naylor lobby of Medical Sciences Building (aka Stone Lobby)  |
| 8:15 - 9:00  | Rise & Shine<br>Melissa & Ziad   |
| Troubleshoot WiFi connections while students wait. |  |
| 8:45 - 9:00  | Meet in Lecture Room MSB 3154  |
| 9:00 - 9:15  | Welcome and Land Acknowledgment<br><i>Dr. Leonardo (Lenny) Salmena</i><br>Associate Professor, Teaching Stream, Dept. of Pharmacology, UofT                                      |
|  | Land Acknowledgment<br><i>Anu Singh</i>  |
|  | How to Maximize Your Experience<br><i>Artur Jakubowski</i>   |
| 9:15 - 10:10                                       | Stay in lecture room<br>Introduction to Pharmacology: A Pharmacists Guide to Understanding Drugs<br><i>Dr. Leonardo Salmena</i>  |
| 10:10 - 10:15                                      | Q&A  |
| 10:15 - 10:25                                      | Inside lecture room MSB 3154<br>Lab #1: How to measure an in vivo NAT2 acetylator phenotype<br>Part A: Caffeine intake inside lecture room.<br><i>Led by Med YSP Instructors</i> |
| 10:25 - 10:30                                      | Meet Instructors & Transfer to lab rooms<br><i>Artur Jakubowski</i>  |
| 10:30 - 10:45                                      | <b>In your lab room</b><br>Meet and Greet<br>(Attendance, Ice breakers)  |
| 10:45 - 11:05                                      | Lab Safety<br>(Fire, Medical, General Lab Safety, + lab coats)   |
| 11:05 - 11:55                                      | Lab #2: Pipetting and Pre-Priming  |
| 11:55 - 12:00                                      | Lab cleanup + Checklist  |

| Tuesday, July 15, 2025                             |  |
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| I Can NAT Believe It!                              |  |
| Time   | Activity   |
| 8:00 - 8:45  | Attendance in MSB, David Naylor lobby of Medical Sciences Building (aka Stone Lobby)   |
| 8:15 - 9:00  | Rise & Shine<br>Alex & Stella  |
| Troubleshoot WiFi connections while students wait. |  |
| 8:55 - 9:00  | Proceed to MSB lab rooms   |
| 9:00 - 11:30                                       | Lab #4: Genotyping of SNPs in the NAT2 gene<br>Part A-B: DNA isolation, and<br>Part C: Setup PCR reaction  |
|  | Lab #3: Recombinant Human NAT1 and Measurement of its Enzyme Activity<br>Part B: Inoculate new culture   |
| 11:30 - 11:55                                      | Lab #3: Recombinant Human NAT1 and Measurement of its Enzyme Activity<br>Part B: Inoculate new culture   |
| 11:55 - 12:00                                      | Lab cleanup + Checklist  |
| 8 AM to 9 AM                                       | Lab #1: How to measure an in vivo NAT2 acetylator phenotype<br>Part C2 & C3: Reconstitute and drop off urine metabolite extracts in Dr. Landon Edgar's lab for HPLC analysis (MSB 4226)<br><b>Led by André and Anu</b> |

| Wednesday, July 16, 2025                           |   |
|--|---|
| Lab Techniques in PharmTox                         |   |
| Time   | Activity  |
| 8:00 - 8:45  | Attendance in Lecture room  |
| 8:15 - 9:00  | Rise & Shine<br>Anka & André  |
| Troubleshoot WiFi connections while students wait. |   |
| <b>Lunch will start late today, bring snacks.</b>  |   |
| 9:00 - 10:00                                       | Meet in MSB 3154  |
|  | Small Molecules Generate Big Signals: Introduction To VEGF Signalling In Cancer (Introduce ELISA technique, 10 min)<br><i>Dr. Leonardo Salmena, Department of Pharmacology and Toxicology, UofT</i> |
| 10:00 - 10:05                                      | Transfer to lab rooms   |
| 10:05 - 10:10                                      | Introduce ELISA competition & Prizes (Instructors)  |
| 10:10 - 10:30                                      | Lab #5: ELISA<br>Part A: Washing plate technique  |
| 10:30 - 10:40                                      | Buffer  |
| 10:40 AM   | <b>Part B: Start at 10:40 AM sharp!</b>   |
| 10:40 - 12:25                                      | Lab #5: ELISA<br>Part B: Setup Experiment   |
| 12:25 - 12:30                                      | Lab cleanup + Checklist   |

| Thursday, July 17, 2025                            |   |
|--|---|
| Toxicology   |   |
| Time   | Activity  |
| 8:00 - 8:45  | Attendance in Lecture room  |
| 8:15 - 9:00  | Rise & Shine<br>Javid & Mads  |
| Troubleshoot WiFi connections while students wait. |   |
| 8:55 - 9:00  | Proceed to MSB lab rooms  |
| 9:00 - 9:15  | Meet in MSB 3154  |
|  | Re-Cap VEGF experiment and announce winners from each team<br><i>Dr. Leonardo Salmena</i>                                     |
| 9:15 - 9:25  | Transfer to lab rooms   |
| 9:25 - 10:45                                       | Lab #3: Recombinant Human NAT1 and Measurement of its Enzyme Activity<br>Part E: Enzyme assay, and<br>Part F: Analyse results |
| 10:45 - 11:00                                      | Lab #6: Microscopy Workshop   |
| 11:00 - 12:00                                      | Lab #7: Cell Cytotoxicity, Part D: How to use a hemocytometer   |

| Friday, July 18, 2025                              |  |
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| Careers & Game Show                                |  |
| Time   | Activity   |
| 8:00 - 8:45  | Attendance in MSB, David Naylor lobby of Medical Sciences Building (aka Stone Lobby)                                 |
| 8:15 - 9:00  | Rise & Shine<br>Amber & Erin   |
| Troubleshoot WiFi connections while students wait. |  |
| 8:55 - 9:00  | Proceed to MSB lab rooms   |
| 9:00 - 10:00                                       | Lab #7: Cell Cytotoxicity<br>Part A: Caspase 3 Assay + Part C: Results<br><b>Read at 18 hr</b>                       |
| 10:00 - 10:55                                      | Lab #4: Genotyping of SNPs in the NAT2 gene<br>Part G: Compare NAT2 Genotype with caffeine metabolism NAT2 Phenotype |
|  | Lab #1: How to measure an in vivo NAT2 acetylator phenotype<br>Part D: Ratio of urinary metabolites                  |
| 10:55 - 11:00                                      | Lab cleanup + Checklist  |
| 11:00 - 11:15                                      | Rotation Determination and Move to Respective Rooms  |

| Attend one of the following sessions as determined by you and your instructor |   |
|---|---|
| 11:15 - 12:00   | University Admissions, <b>MSB 3153</b><br><i>Floyd Noronha</i>  |
|   | or  |
| 11:15 - 12:00   | Panel Discussions, MSB 2172<br>Led by Instructors               |
|   | or  |
| 11:15 - 12:00   | Anatomy Museum, MSB 2278<br>NO PHONE RULE<br>Led by Instructors |

| 12 - 1 PM Lunch |  |
|-----------------|--|
| 12:55 - 1:00    | Proceed to lecture room MSB 3153   |
| 1 - 1:55        | Meet in MSB 3153<br>Water You Drinking? Understanding Heavy Metal Toxicity<br><i>Dr. Gurnit Kaur</i><br>Assistant Professor, Dep. of Pharmacology and Toxicology   |
|                 | Q&A  |
| 1:55 - 2:00     | Q&A  |
| 2 - 2:10        | Transfer to lab rooms  |
| 2:10 - 4:00     | Lab #1: How to measure an in vivo NAT2 acetylator phenotype<br>Part B: Urine Collection<br>Part C1: Extract Metabolites<br>2025: <b>André &amp; Anu</b> to collect samples from all rooms for HPLC analysis, needed for Tuesday 8:45 AM. |
| 4:00 - 4:50     | Lab #3: Recombinant Human NAT1 and Measurement of its Enzyme Activity<br>Part A: Start O/N culture   |
| 4:50 - 4:55     | Introduce Game Show (Instruvt)   |
| 4:55 - 5:00     | Led by each Team<br>Lab cleanup + Checklist  |

| 12 - 1 PM Lunch                       |   |
|---------------------------------------|---|
| 12:55 - 1:00                          | Proceed to lecture room MSB 3154  |
| 1 - 2 PM                              | Meet in MSB 3154<br>Immunopharmacology: how to use your own cells as drugs<br><i>Dr. Landon Edgar, Assistant Professor, Dep. of Pharmacology and Toxicology</i> |
|                                       | Q&A   |
| 1:55 - 2:00                           | Q&A   |
| 2 - 2:10                              | Transfer to lab rooms   |
| 2:10 - 2:40                           | Lab #3: Recombinant Human NAT1 and Measurement of its Enzyme Activity<br>Part C: Induce protein expression  |
| 2:40 - 4:50                           | Lab #4: Genotyping of SNPs in the NAT2 gene<br>Part D: Setup restriction enzyme digest<br>Part E: Run Agarose Gel<br>Part F: Determine NAT2 Genotype            |
| 4:50 - 5:00                           | Lab cleanup + Checklist   |
| Approx. 5-6 PM Done by DTL technician | Lab #3: Recombinant Human NAT1 and Measurement of its Enzyme Activity<br>Part D: Extract Protein  |

| 12:30 - 1:30 Lunch |  |
|--------------------|--|
| 1:30 - 4:30        | Proceed to lab rooms   |
|                    | Lab #5: ELISA<br>Part C: Continue                                      |
|                    | Lab #5: ELISA<br>Part D: Excel for Scientists                          |
| 4:30 - 4:35        | Lab #5: ELISA<br>Part C: Continue                                      |
| 4:30 - 4:35        | Lab cleanup + Checklist  |
| 4:35 - 4:40        | Move to lecture room MSB 3154  |
| 4:40 - 5:00        | Game Show Trial run<br><i>Led by Melissa (Student Experience Guru)</i> |

| 12 - 1 PM Lunch          |  |
|--------------------------|--|
| 12:55 - 1:00             | Proceed to lecture room MSB 3154   |
| 1 - 2 PM                 | Meet in MSB 3154<br>Introduction to Toxicology<br><i>Dr. Cindy Woodland, Professor, Dept. of Pharmacology and Toxicology, UofT</i> |
|                          | Q&A  |
| 1:55 - 2:00              | Q&A  |
| 2:00 - 2:10              | Transfer to lab rooms  |
| 2:10 - 5 PM              | Lab #7: Cell Cytotoxicity<br>Part C: Save Cells for Trypan Blue Assay<br><b>Do first!</b>  |
|                          | Lab #7: Cell Cytotoxicity<br>Part A: Caspase 3 Assay   |
| During 90 min incubation | Lab #7: Cell Cytotoxicity<br>Part B: Trypan Blue exclusion   |
|                          | Lab #7: Cell Cytotoxicity<br>Part A: Caspase assay   |
| 2 - 5 PM                 | Lab #7: Cell Cytotoxicity<br>Part A: Caspase assay   |
| 4:55 - 5:00              | Lab cleanup + Checklist  |

| 12 - 1 PM Lunch |  |
|-----------------|--|
| 1:00 - 1:10     | <b>Meet in your lab room</b>   |
| 1:10 - 1:40     | Surveys (Lab rooms)<br><a href="https://bit.ly/YSPT25-pharmtox">https://bit.ly/YSPT25-pharmtox</a>   |
|                 | Wrap up (pick up belongings and certificates)  |
| 1:40 - 1:50     | Transfer to lecture room <b>MSB 3153</b>   |
| 1:50 - 1:55     | Career Perspectives Panel  |
| 1:55 - 3:20     | Career speaker #1<br><i>Zarif Mohaiemen, MSc</i>   |
| 2:00 - 2:25     | Switch over  |
| 2:25 - 2:50     | Career speaker #2<br><i>Noufissa Kabli, PhD</i>  |
| 2:50 - 2:55     | Switch over  |
| 2:55 - 3:20     | Career speaker #3<br><i>Justin Grant, PhD</i>  |
| 3:20 - 3:30     | Buffer and Break   |
| 3:20 - 4:20     | Land Acknowledgment<br><i>Landon See</i><br>Extra Super Galactic Brain Buster Trivia Game Show<br><i>Melissa (Student Experience Guru)</i> |
|                 | Closing Remarks  |
|                 | <i>Dr. Leonardo Salmena &amp; Artur Jakubowski</i>   |
|                 | Reception & Refreshments   |
| 4:25 - 5:00     | David Naylor lobby of Medical Sciences Building (aka Stone Lobby)  |

| Reminders for Students   |  |
|--|--|
| Wear closed toe shoes and long pants because you are performing wet labs.            |  |
| For troubleshooting WiFi, visit <a href="http://bit.ly/ysp-wifi">bit.ly/ysp-wifi</a> |  |
| <b>VERIFY anatomy form is signed.</b>  |  |

| Med YSP Photos  |  |
|---|--|
| <a href="https://medysp.pixieset.com">https://medysp.pixieset.com</a> |  |
| Password: Medysp2025  |  |
| Deadline to download photos<br><b>Fri. Aug. 15, 2025</b>              |  |

| Friday Game Show Prizes   |   |   |
|---|---|---|
| Prizes awarded to top 3 scores.   |   |   |
| Crew neck   | Backpack  | Hoodie  |
|  |  |  |