

CAMB 708 Syllabus – Fall 2023 (revised 7-Sept-2023)

Instructors: Katie Bar, MD and Ron Collman, MD

This will be one semester half-credit class, held every other week, that is research paper-based utilizing the current literature in HIV virology, pathogenesis and cure research. The class will have a journal club format with attendance and participation open to the full Penn student & postdoc community (“teach-your-peers”). Presentations will consist of background literature summary with key prior work in the field; a data-based presentation and analysis of the paper under review; and a summary with suggestions for future directions. Enrolled students will be responsible for 2 presentations over the duration of the half-year course, will participate in discussion of each paper presented by others, and will manage the coordination of presentations by other participants as well as bi-weekly paper selection in conjunction with the instructors.

Enrolled Student Responsibilities

1. Present a paper approximately once every 6-8 weeks (exact schedule will depend on number of enrolled students).
2. For the classes when another student is presenting the paper, participate via presentation and discussion of at least one figure per paper - and being ready to present/discuss additional figures if needed, if too few other students are able to discuss the figure.
3. Manage the email list and be sure students are notified a week in advance of the paper and presenter (and provide the information to CFAR Program Manager Mandi Bell for distribution on the email list)
4. Ensure that papers covered are entered into the online listing of articles presented.
5. Work with the other enrolled students to:
 - a. ensure that every session is covered on the schedule by an enrolled or other participating student (schedule at least 6 weeks in advance)
 - b. manage the list of possible papers that the instructors will provide, or for papers that you or other students identify, ensure the papers selected are appropriate and broadly distributed among topics via discussion with instructors, and not duplicative of previously presented papers
 - c. working with the instructors, identify and invite 1-2 guest faculty members to participate in each class – which requires at least 1 week advance notice for scheduling
 - d. ensure that papers are selected and distributed to the email list at least one week in advance
 - e. one of the enrolled students should meet with any non-enrolled student scheduled to present to review the structure of the presentations (eg, background, introduction, figures, conclusions, critique, etc.)
 - f. Maintain current the online listing of papers that have been presented

Syllabus: Papers are selected as the course progresses. What follows is a listing of prior semesters’ class papers covered, to serve as examples:

Aid M, Colarusso A, Walker-Sperling V, Barouch DH. Peripheral blood biomarkers predict viral rebound following antiretroviral therapy discontinuation in SIV-infected, early ART-treated rhesus macaques. Cell Rep Med. 2023 Jul 18;4(7):101122. doi: 10.1016/j.xcrm.2023.101122. PMID: 37467721; PMCID: PMC10394255.
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Hoffmann MAG, Yang Z, Huey-Tubman KE, Cohen AA, Gnanapragasam PNP, Nakatomi LM, Storm KN, Moon WJ, Lin PJC, West AP Jr, Bjorkman PJ. ESCR1 recruitment to SARS-CoV-2 spike induces virus-like particles that improve mRNA vaccines. Cell. 2023 Apr 21:S0092-8674(23)00420-8. doi: 10.1016/j.cell.2023.04.024. Epub ahead of print. PMID: 37146611; PMCID: PMC10121106.

Casazza JP, Cale EM, Narpala S, Yamshchikov GV, Coates EE, Hendel CS, Novik L, Holman LA, Widge AT, Apte P, Gordon I, Gaudinski MR, Conan-Cibotti M, Lin BC, Nason MC, Trofymenko O, Telscher S, Plummer SH, Wycuff D, Adams WC, Pandey JP,

McDermott A, Roederer M, Sukienik AN, O'Dell S, Gall JG, Flach B, Terry TL, Choe M, Shi W, Chen X, Kaltovich F, Saunders KO, Stein JA, Doria-Rose NA, Schwartz RM, Balazs AB, Baltimore D, Nabel GJ, Koup RA, Graham BS, Ledgerwood JE, Mascola JR; VRC 603 Study Team. **Safety and tolerability of AAV8 delivery of a broadly neutralizing antibody in adults living with HIV: a phase 1, dose-escalation trial.** *Nat Med.* 2022 May;28(5):1022-1030. doi: 10.1038/s41591-022-01762-x. Epub 2022 Apr 11. PMID: 35411076; PMCID: PMC9876739.

Gantner P, Buranapraditkun S, Pagliuzza A, Dufour C, Pardons M, Mitchell JL, Kroon E, Sacdalan C, Tulmethakaan N, Pinyakorn S, Robb ML, Phanuphak N, Ananworanich J, Hsu D, Vasan S, Trautmann L, Fromentin R, Chomont N. **HIV rapidly targets a diverse pool of CD4+ T cells to establish productive and latent infections.** *Immunity.* 2023 Mar 14;56(3):653-668.e5. doi: 10.1016/j.immuni.2023.01.030. Epub 2023 Feb 17. PMID: 36804957; PMCID: PMC10023508.

Lee JH, Sutton HJ, Cottrell CA, Phung I, Ozorowski G, Sewall LM, Nedellec R, Nakao C, Silva M, Richey ST, Torres JL, Lee WH, Georgeson E, Kubitz M, Hodges S, Mullen TM, Adachi Y, Cirelli KM, Kaur A, Allers C, Fahlberg M, Grasperge BF, Dufour JP, Schiro F, Aye PP, Kalyuzhnyi O, Liguori A, Carnathan DG, Silvestri G, Shen X, Montefiori DC, Veazey RS, Ward AB, Hangartner L, Burton DR, Irvine DJ, Schief WR, Crotty S. **Long-primed germinal centres with enduring affinity maturation and clonal migration.** *Nature.* 2022 Sep;609(7929):998-1004. doi: 10.1038/s41586-022-05216-9. Epub 2022 Sep 21.

Velu V, Titanji K, Ahmed H, Shetty RD, Chennareddi LS, Freeman GJ, Ahmed R, Amara RR. **PD-1 blockade following ART interruption enhances control of pathogenic SIV in rhesus macaques.** *Proc Natl Acad Sci U S A.* 2022 Aug 16;119(33):e2202148119. doi: 10.1073/pnas.2202148119. Epub 2022 Aug 8. PMID: 35939675; PMCID: PMC9388156.

Clark IC, Mudvari P, Thaploo S, Smith S, Abu-Laban M, Hamouda M, Theberge M, Shah S, Ko SH, Pérez L, Bunis DG, Lee JS, Kilam D, Zakaria S, Choi S, Darko S, Henry AR, Wheeler MA, Hoh R, Butrus S, Deeks SG, Quintana FJ, Douek DC, Abate AR, Boritz EA. **HIV silencing and cell survival signatures in infected T cell reservoirs.** *Nature.* 2023 Jan 4. doi: 10.1038/s41586-022-05556-6. Epub ahead of print. PMID: 36599978.

Lien K, Mayer W, Herrera R, Padilla NT, Cai X, Lin V, Pholcharoenchit R, Palefsky J, Tugizov SM. **HIV-1 Proteins gp120 and Tat Promote Epithelial-Mesenchymal Transition and Invasiveness of HPV-Positive and HPV-Negative Neoplastic Genital and Oral Epithelial Cells.** *Microbiol Spectr.* 2022 Dec 21;10(6):e0362222. doi: 10.1128/spectrum.03622-22. Epub 2022 Oct 31. PMID: 36314970; PMCID: PMC9770004.

Leggat DJ, Cohen KW, Willis JR, Fulp WJ, deCamp AC, Kalyuzhnyi O, Cottrell CA, Menis S, Finak G, Ballweber-Fleming L, Srikanth A, Plyler JR, Schiffner T, Liguori A, Rahaman F, Lombardo A, Philiponis V, Whaley RE, Seese A, Brand J, Ruppel AM, Hoyland W, Yates NL, Williams LD, Greene K, Gao H, Mahoney CR, Corcoran MM, Cagigi A, Taylor A, Brown DM, Ambrozak DR, Sincomb T, Hu X, Tingle R, Georgeson E, Eskandarzadeh S, Alavi N, Lu D, Mullen TM, Kubitz M, Groschel B, Maenza J, Kolokythas O, Khati N, Bethony J, Crotty S, Roederer M, Karlsson Hedestam GB, Tomaras GD, Montefiori D, Diemert D, Koup RA, Laufer DS, McElrath MJ, McDermott AB, Schief WR. **Vaccination induces HIV broadly neutralizing antibody precursors in humans.** *Science.* 2022 Dec 2;378(6623):eadd6502. doi: 10.1126/science.add6502. Epub 2022 Dec 2. PMID: 36454825.

Frank JA, Singh M, Cullen HB, Kirou RA, Benkaddour-Boumzaouad M, Cortes JL, Garcia Pérez J, Coyne CB, Feschotte C. **Evolution and antiviral activity of a human protein of retroviral origin.** *Science.* 2022 Oct 28;378(6618):422-428. doi: 10.1126/science.abq7871. Epub 2022 Oct 27. PMID: 36302021.

Mangala Prasad, V., Leaman, D. P., Lovendahl, K. N., Croft, J. T., Benhaim, M. A., Hodge, E. A., Zwick, M. B., & Lee, K. K. (2022). **Cryo-ET of Env on intact HIV virions reveals structural variation and positioning on the Gag lattice.** *Cell*, 185(4), 641–653.e17. <https://doi.org/10.1016/j.cell.2022.01.013>

Luis M. Molinos-Albert, Valérie Lorin, Valérie Monceaux, Sylvie Orr, Asma Essat, Jérémy Dufloo, Olivier Schwartz, Christine Rouzioux, Laurence Meyer, Laurent Hocqueloux, Asier Sáez-Cirión, Hugo Mouquet & ANRS VISCONTI Study Group (2022). **Transient viral exposure drives functionally coordinated humoral immune responses in HIV-1 post treatment controllers.** *Nature.* 1944 (2022)

Ferrari, B., Da Silva, A. C., Liu, K. H., Saidakova, E. V., Korolevskaya, L. B., Shmagel, K. V., Shive, C., Pacheco Sanchez, G., Retuerto, M., Sharma, A. A., Ghneim, K., Noel-Romas, L., Rodriguez, B., Ghannoum, M. A., Hunt, P. P., Deeks, S. G., Burgener, A. D., Jones, D. P., Dobre, M. A., . . . Younes, S.-A. (2022). **Gut-derived bacterial toxins impair memory CD4+ T cell mitochondrial function in HIV-1 infection.** *The Journal of Clinical Investigation*, 132(9). <https://doi.org/10.1172/JCI149571>

Maehigashi T, Ahn S, Kim UI, Lindenberger J, Oo A, Koneru PC, Mahboubi B, Engelman AN, Kvaratskhelia M, Kim K, Kim B. **A highly potent and safe pyrrolopyridine-based allosteric HIV-1 integrase inhibitor targeting host LEDGF/p75-integrase interaction site.** *PLoS Pathog.* 2021 Jul 22;17(7):e1009671. doi: 10.1371/journal.ppat.1009671. PMID: 34293041; PMCID: PMC8297771.