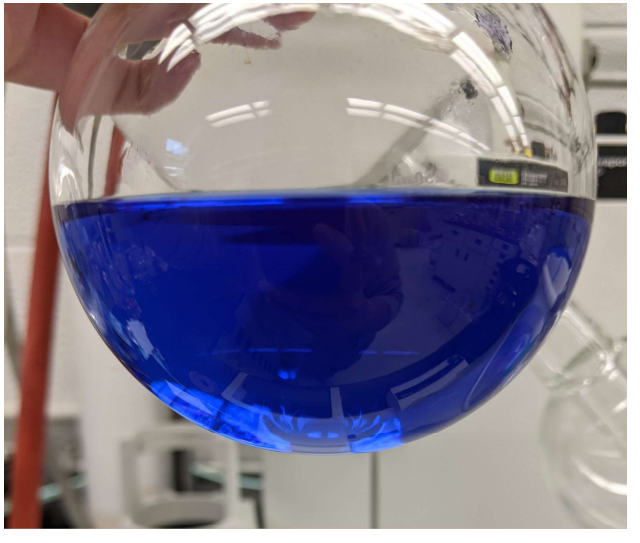
Which colour do you want for your cells, pink or blue? -Improving the synthesis of cyanine dyes

Peihan Xu
xupeiha@uwindsor.ca

Dr. John J. Hayward
Department of Chemistry and Biochemistry, University of Windsor

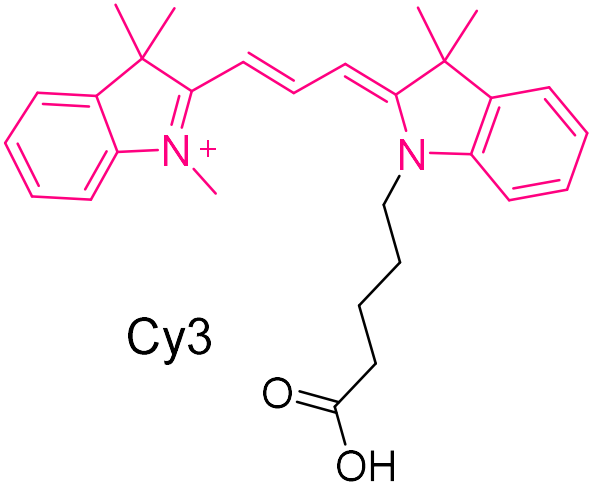
Dr. John F. Trant
University of Windsor

Which colour do you want for your cells, pink or blue? - Improving the synthesis of cyanine dyes

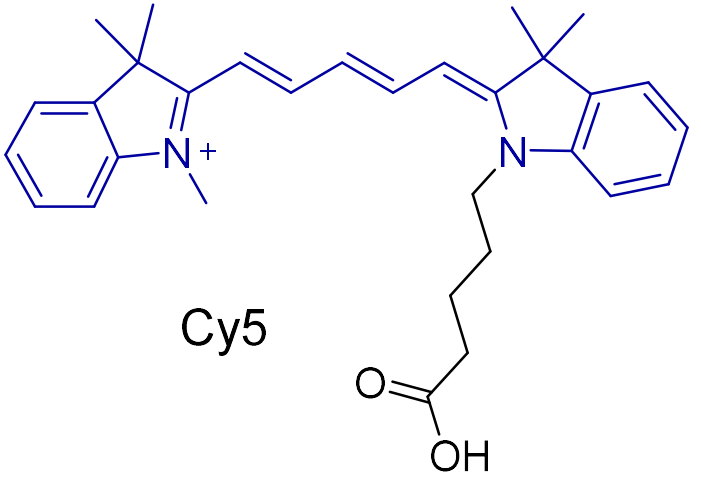


Peihan ‘Hazel’ Xu 2022

Target molecules

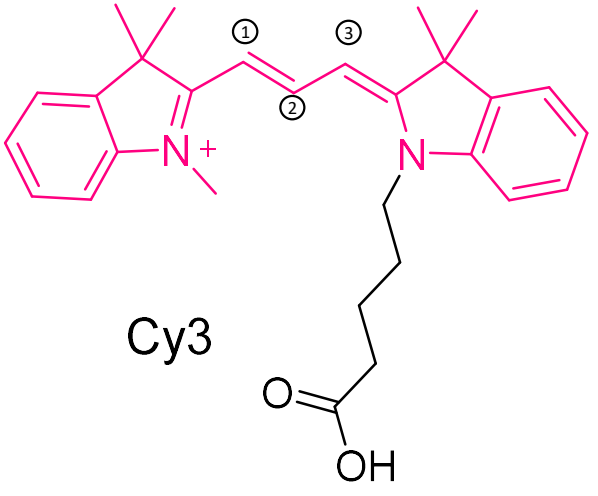


Cy3

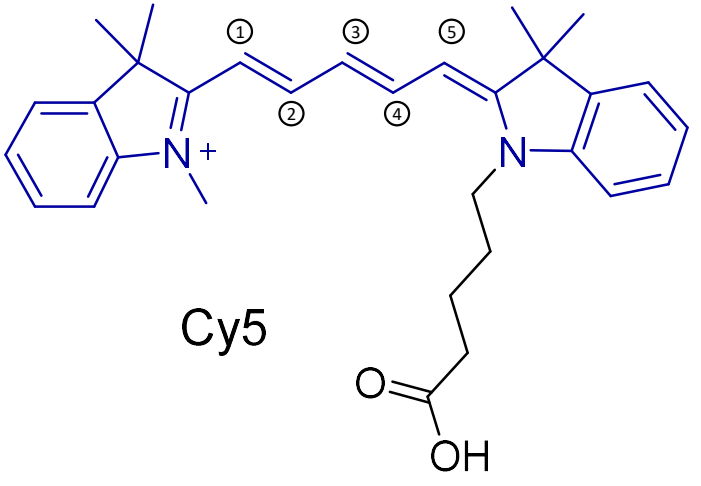


Cy5

Target molecules

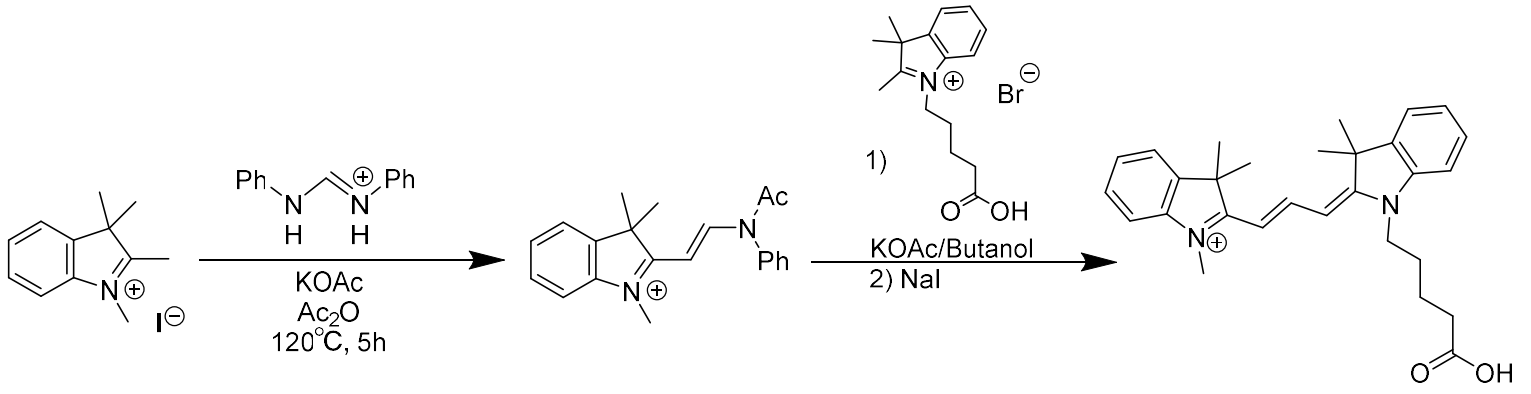


Cy3



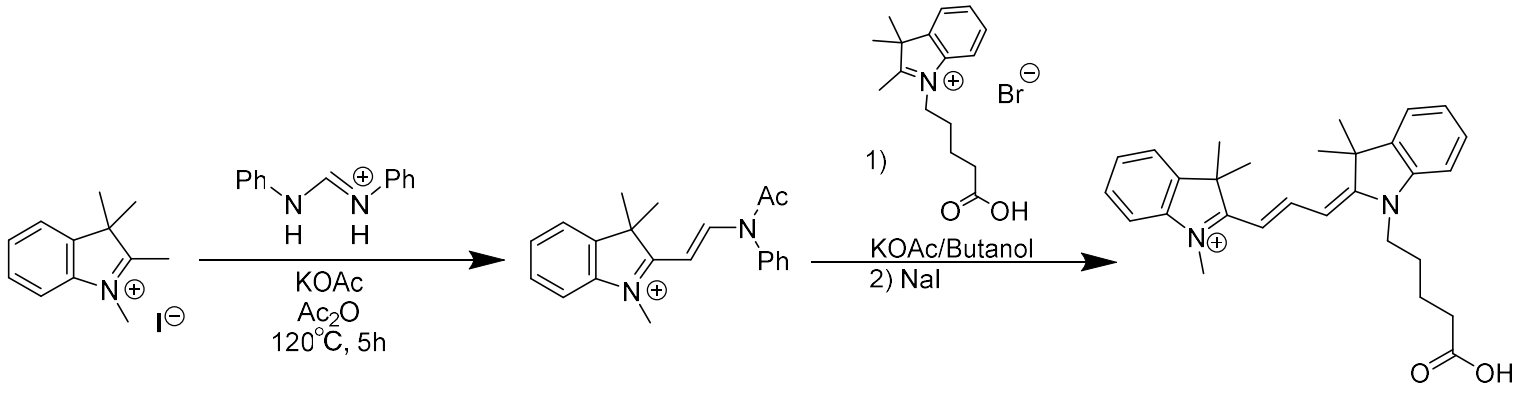
Cy5

Synthesis route of Cy3



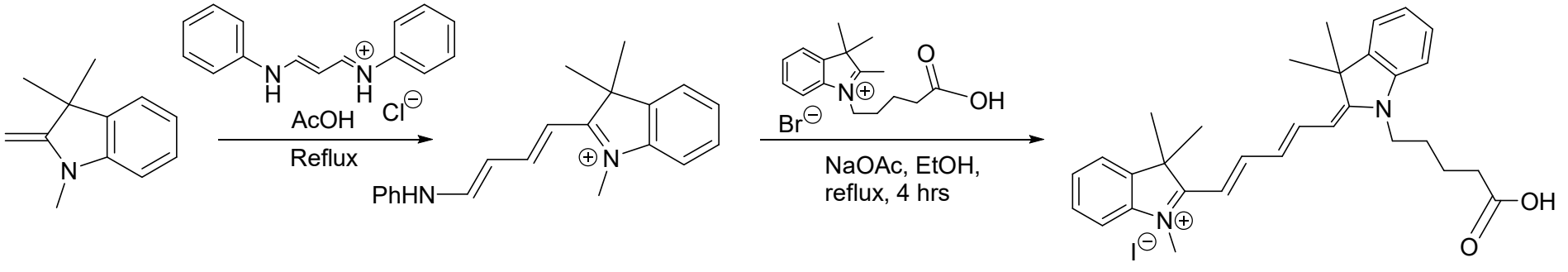
Bakht, M. K., Lovnicki, J. M., Tubman, J., Stringer, K. F., Chiaramonte, J., Reynolds, M. R., Derecichei, I., Ferraiuolo, R.-M., Fifield, B.-A., Lubanska, D., Oh, S. W., Cheon, G. J., Kwak, C., Jeong, C. W., Kang, K. W., Trant, J. F., Morrissey, C., Coleman, I. M., Wang, Y., … Porter, L. A. (2020). Differential Expression of Glucose Transporters and Hexokinases in Prostate Cancer with a Neuroendocrine Gene Signature: A Mechanistic Perspective for 18F-FDG Imaging of PSMA-Suppressed Tumors. Journal of Nuclear Medicine, 61(6), 904–910. https://doi.org/10.2967/jnumed.119.231068

Synthesis route of Cy3

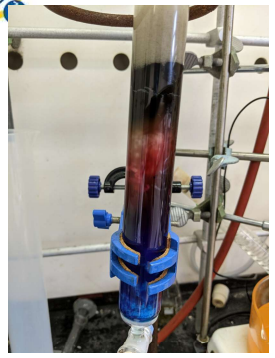
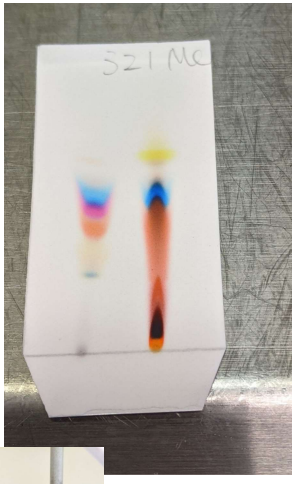


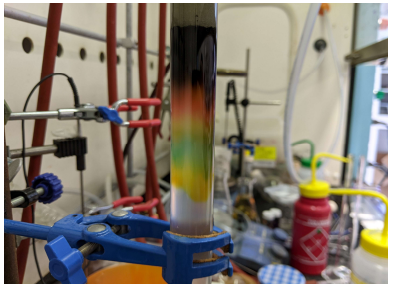
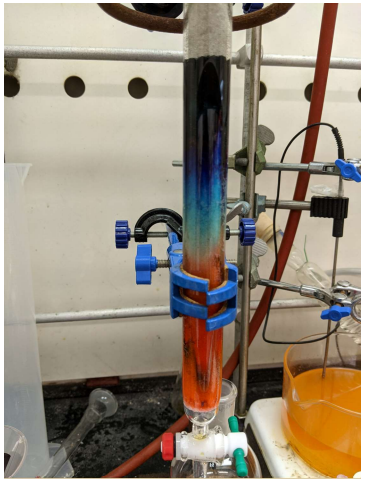
Bakht, M. K., Lovnicki, J. M., Tubman, J., Stringer, K. F., Chiaramonte, J., Reynolds, M. R., Derecichei, I., Ferraiuolo, R.-M., Fifield, B.-A., Lubanska, D., Oh, S. W., Cheon, G. J., Kwak, C., Jeong, C. W., Kang, K. W., Trant, J. F., Morrissey, C., Coleman, I. M., Wang, Y., … Porter, L. A. (2020). Differential Expression of Glucose Transporters and Hexokinases in Prostate Cancer with a Neuroendocrine Gene Signature: A Mechanistic Perspective for 18F-FDG Imaging of PSMA-Suppressed Tumors. Journal of Nuclear Medicine, 61(6), 904–910. https://doi.org/10.2967/jnumed.119.231068

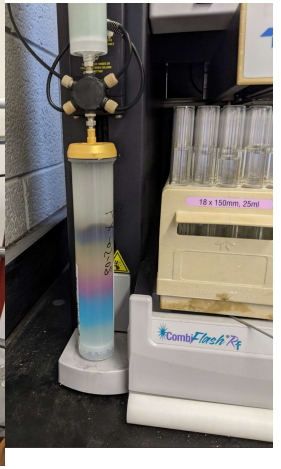
(Original) Synthesis route of Cy5



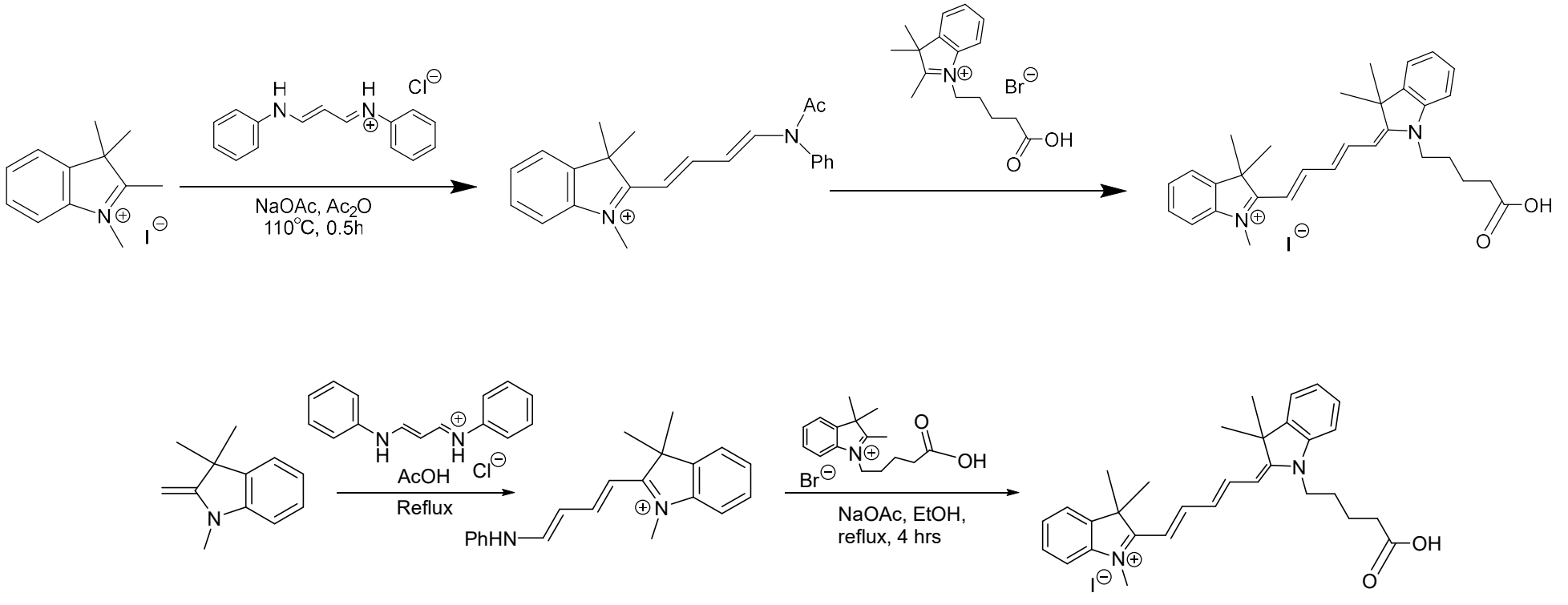
JUNG, M. E., & KIM, W.-J. (2006). Practical syntheses of dyes for difference gel electrophoresis. *Bioorganic & Medicinal Chemistry*, *14*(1), 92–97. https://doi.org/10.1016/j.bmc.2005.07.068



521 MC


18 x 150mm, 25ml
CombiFlash Rf


(Optimized) Synthesis route of Cy5



Supervisor: Dr. John F. Trant

Mentor: Dr. John J. Hayward