

Lecture 5: Cell Targeting

I. Overview: targeting nanosystems to cells

- A. antibody targeting
- B. peptide targeting
- C. aptamer targeting

II. Antibodies – polyclonal and monoclonal

- A. Where do antibodies come from – in nature?
- B. How do we make them in the laboratory?
- C. Monoclonal antibodies
- D. Therapy problems with mouse monoclonal antibodies
- E. “Humanizing” monoclonal antibodies to reduce adverse host immune reactions
- F. Why antibodies may not be a good overall choices for targeting nanosystems to cells

III. Peptide targeting

- A. How does a peptide target?
- B. Examples of peptide targeting
- C. Creating new peptides by random peptide phage display libraries
- D. High-throughput screening of those peptide libraries
- E. Advantages and disadvantages of peptide targeting

IV. Aptamer targeting

- A. What are aptamers and how do they target?
- B. Some different types of aptamers
- C. How do you make aptamers?
- D. How do you screen for useful aptamers?

Lecture 5 References

Carmen, S. Jermutus, L. Concepts in antibody phage display, BRIEFINGS IN FUNCTIONAL GENOMICS AND PROTEOMICS. VOL 1. NO 2. 189–203. JULY 2002

Yang, X., Bassett, S.E., Li, X., Luxon, B.A., Herzog, N.K., Shope, R.E., Aronson, J., Prow, T.W., Leary, J.F., Kirby, R., Ellington, A.D., Gorenstein, D.G.: “Construction and selection of bead bound combinatorial oligonucleoside phosphorothioate and phosphorodithioate aptamer libraries designed for rapid PCR-based sequencing” *Nucleic Acids Research* 30 (23)e132: 1-8, 2003.

Yang, X., Li, X., Prow, T.W. Reece, L.M., Bassett, S.E., Luxon, B.A., Herzog, N.K., Aronson, J., Shope, R.E., Leary, J.F., Gorenstein, D.G. “Immunofluorescence Assay and Flow Cytometric Selection of Bead Bound Aptamers” *Nucleic Acids Research* 31 (10): 1-8, 2003