

Last time, we got an overview of the disease. Today, we'll review that overview and discuss the articles below.

Chronic Beryllium Disease

Discussion based on:

- [1] G. A. Day, M. D. Hoover, A. B. Stefaniak, R. M. Dickerson, E. J. Peterson, M. A. Esmen, and R. C. Scripsick. Bioavailability of beryllium oxide particles: An in vitro study in the murine j774a.1 macrophage cell line model. *Experimental lung research*, 31:341–360, 2005.
- [2] S. Sturgill-Koszycki, P. H. Schlesinger, P. Chakraborty, P. L. Haddix, H. L. Collins, A. K. Fok, R. D. Allen, S. L. Gluck, J. Heuser, and D. G. Russel. Lack of acidification in mycobacterium phagosomes produced by exclusion of the vesicular proton-ATPase. *Science*, 263:678–681, 1994.
- [3] Finch, G. L.; Hoover, M. D.; Fletcher, F. H.; Nikula, K. J.; Belinsky, S. A.; Haley, P. J.; Griffith, W. C. Animal models of beryllium-induced lung disease. *Environmental Health Perspectives*, 104: S5, 1996.
- [4] Stefaniak, A. B.; Day, G. A.; Hoover, M. D.; Breysse, P. N.; Scripsick, R. C. Differences in dissolution behavior in phagolysosomal simulant fluid for single-constituent and multi-constituent materials associated with beryllium sensitization and chronic beryllium disease.

Sources of Beryllium and likely source of beryllium inhaled

Discussion based on:

- [1] A. B. Stefaniak, M. D. Hoover, G. A. Day, R. M. Dickerson, E. J. Peterson, M. S. Kent, C. R. Schuler, P. N. Breysse, and R. C. Scripsick. Characterization of physicochemical properties of beryllium aerosols associated with prevalence of chronic beryllium disease. *J. Environ. Monit.*, 6:1–11, 2004
- [2] R. O. Adams and J. T. Hurd. The properties of beryllium surfaces and films. *Journal of the Less-Common Metals*, 18:399–409, 1969.

Course Plan

As you can see from the discussion, there are a lot of fundamentals to clear up. In a series of projects, we will study the material structure of beryllium oxide, the chemistry of beryllium oxide dissolution, and finally how the beryllium oxide dissolved products interact with common biomolecules in macrophages. As we do this, we will learn some of the standard algorithms in computational sciences and explore the pathway to the disease.