**Sidebar 3-13A Pickle juice and super-crystallizers.** In a quite original study 141, students guided by researchers at the Hauptmann-Woodward Institute in Buffalo, NY, have prepared 96 crystallization cocktails from common products found in most drugs stores. Amongst those were pickle juice, hair shampoo, shaving cream, food colors, fish sauce, energy drinks, mustard, rum, and many others. These 'crystallization cocktails' contain a wide variety of substances and ingredients, some of them also used as additives in conventional crystallization cocktails. One of the most intriguing results of the experiments was that six of the 20 tested proteins yielded more than 100 successful trials containing crystals in spite of the rather untargeted and bizarre cocktail selection. As concluded from controlled random trials (Figure 3-39), the experiment confirms that some proteins have a high propensity to crystallize. The chemical subset used to crystallize them is then much less important that the innate (or engineered) ability of the protein molecules to self-organize into an ordered solid phase - a crystal.

The results also point out that in order to test the efficacy of a new crystallization reagent, it is not enough to just show that it is able to crystallize some well-behaved standard proteins. More careful statistical tests against reagents with known propensities are required (and often absent). Poor reproducibility (Sidebar 3-12) further increases the number of trials needed to demonstrate significantly increased efficacy of newly introduced reagents.