

## Difficulties and Advances in Teaching Good Practices in Scientific Research

**André Luiz Pinto**

Centro Brasileiro de Pesquisas Físicas (CBPF), Rio de Janeiro, RJ, Brazil

There has been increasing concern about research integrity since the 1980's. What began as a result of a series of scandals in North American science soon turned into the realization that there was a global problem to face. Since the beginning it has been clear that the main efforts could not rely solely on the investigation and punishment of those involved in stepping outside the bounds of behavior that is now formally defined as responsible conduct. Scientific editors have tried to increase the barriers to bad science mainly through plagiarism search software and providing space for raw data. Nevertheless, the most important point is to guarantee the transmission of Science's values through the generations. This global focus on training has brought in a lot of different support materials for training courses, including some recently released online training programs. The increasing concern of Brazilian society about Ethics creates a sensation of perfect timing for such efforts, in addition to the current commitment of our funding agencies in this direction. On the other hand, some difficulties have appeared. The most surprising problem is the resistance from older generations to such trainings, with some individuals demonstrating notions of ethical behavior in science that are far from the global consensus. The most common problem seems to arise from a secondary education where plagiarism is a common practice and where research is believed to be the collection of ideas produced by somebody else. More trivial problems, but still common, include a lack of "true love" for science, leading students to enroll in graduate programs either because of a lack of employment or because they think that the title associated with an advanced degree will bring them better jobs. For all of the reasons mentioned here, proper training in research integrity is of utmost importance.

**Keywords:** Punishment vs education; evolving norms/bioinformatics tools; responsible conduct in research (RCR)