

Combinatorial Chemistry: Introduction

Combinatorial chemistry is a method used by chemists in the pharmaceutical (drug-producing) industry to produce small quantities of many similar compounds simultaneously. Several hundred related compounds can be produced in quantities of around 2 mg each by the use of computer-controlled syringes, also known as robots, that can add reagents, heat, stir and carry out other operations without human intervention. The compounds can then be quickly tested for possible activity as drugs. Any that show promise are then made in larger quantities for further testing.



Some background

The idea of combinatorial chemistry stems from the work of the US chemist Robert Merrifield in the 1960s who developed semi-automatic methods for making peptides from amino acids. He also developed the method of building up peptides attached to resin beads, by adding one amino acid at a time, and then releasing the final compound at the end of the synthesis. The use of computer control came later. Merrifield won the 1984 Nobel Prize for Chemistry.

Did you know?

A set of compounds made by combinatorial chemistry is called a library.

Compounds are usually made in groups of 96 on an 8 x 12 tray.

Combinatorial chemistry can produce a library of 50,000 compounds in five days.

Using traditional methods a chemist can produce 50 - 100 compounds per year.