Turing description of interacting molecules explains how fingers and toes form

Your arms and toes began as tiny buds that sprouted from your sides when you were just a four-week-old embryo. By six weeks, these limb buds had grown longer and five rods of cartilage had appeared in their flattened tips. By week seven, the cells between the rods had died away, sculpting five small fingers or toes from once-solid masses of flesh.

Now, a team of scientists led by James Sharpe from the Centre for Genomic Regulation in Barcelona has discovered that these events are orchestrated by three molecules. They mark out zones in the embryonic hand where fingers will grow, and the spaces in between that are destined to die. Without this trinity, pianos and keyboards wouldn't exist, jazz hands would be jazz palms, and giving someone the finger would be impossible.

These three molecules work in a way first envisioned by legendary English mathematician and code-breaker Alan Turing. Back in 1952, Turing proposed a simple mathematical model in which two molecules could create patterns by spreading through tissues and interacting with each other. For example, the first molecule might activate the second, while the second blocks the first. Neither receives any guidance about where to go; through their dance, they spontaneously organise themselves into spots or stripes.

Read the full, original story: How did you get five fingers?