systematically searched for derivatives of salicylic acid in 1897. His search was triggered by his father who suffered from rheumatoid arthritis and did not tolerate high doses of salicylic acid due to intestinal tract irritation and emesis. One of the first derivatives he synthesized was acetylsalicylic acid which is known since 1899 as Aspirin® (Schrör 2008). It took more than 75 years until it was discovered that the chemical derivatization also led to an advantageous change in the mechanism of action as it turns the drug into an irreversible inhibitor thereby preserving its therapeutic effect beyond compound exposure. The latter is the basis for the success of low-dose acetylsalicylic acid treatment as anticoagulant therapy used by millions of patients today.

1.2 Ergotamine

The fungus *Claviceps purpurea* and other clavicipitaleans form ergot sclerotia to produce their spores in oat, rye, wheat, and other grasses. These sclerotia contain more than 50 different indole alkaloids, referred to as ergot alkaloids. Many of these are highly toxic due to their vasoconstrictive properties leading to gangrenous loss of the limbs, hallucinations, and dementia. The first documented ergotism epidemic of human toxicity occurred in central Europe in 857 AD, and it took almost 1,000 years to realize the causal relationship and improve agricultural practices. In herbal medicine ergot was first mentioned in the late sixteenth century for use in obstetrics to induce uterine contractions and hasten childbirth, to reduce postpartum hemorrhage, and to induce abortion. When migraine was proposed to be caused by vasodilation by sympathetic deficit in the mid-nineteenth century, the British surgeon Edward Woakes recommended ergot as a vasoconstricting treatment in 1868 (Woakes 1868). The Swiss biochemist Arthur Stoll isolated ergotamine as the active ingredient of ergot sclerotia in 1918 at Sandoz, and the company started to market ergotamine (Gynergen®) in 1921 for the treatment of migraine. Twenty years later, Albert Hofmann, a chemist and coworker of Arthur Stoll who worked on the isolation and synthesis of active ergot constituents, wanted to engraft the respiratory and circulatory stimulating effect of nicotinic acid diethylamide (marketed under the trade name of Coramine®) onto the ergotamine structure. The result was the discovery of lysergic acid diethylamide, better known as LSD, a psychedelic drug (Fig. 1).

1.3 Penicillin

Alexander Fleming serendipitously discovered the antibiotic effect of the fungus *Penicillium rubens* in 1928 when working with staphylococci cultures (Fleming 1929). One such culture was contaminated with a fungus, and the colonies of staphylococci around the mold were destroyed, whereas other colonies farther away were unaffected. He grew the fungus in pure culture, established that it also killed other disease-causing bacteria, and named the unknown active ingredient