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Editorial

Today tablets are more than 150 years old, but they still represent 50–60% of the pharmaceutical dosage forms administered (75% of the solid dosage forms).

The means of making satisfactory tablets has been known for a long time, and since studies in compression physics were initiated in the 1950s in the US and Europe using instrumented tableting machines, and later simulators, the processes occurring when a powder bed undergoes pressure are better understood.

In our opinion, however, there is still a central question to be answered—why some particles form coherent tablets when pressed together and why others do not? Indeed, since Newton's famous observation at the beginning of the 18th century that bodies brought close enough stick together, the forces explaining interparticular cohesion have been elucidated. Nevertheless, when considering, for instance, molecular crystals, these forces can account only for differences in cohesion from 1 to 3, whereas differences in 1–100 in tablet strength can be noted. Some explanations have been put forward, such that crystal defects may confer different mechanical behaviour to particles.

This question is still a matter of debate and justifies the constant interest in compression physics, in addition to the practical use of this discipline in tablet formulation. Of course, the aim of this special issue 'compression physics', the first one in the journal, is not to bring a definitive answer to the basic question raised on particle bonding, but to take the opportunity to take stock of the various theories.

One review article and ten research articles are proposed. The review will expose the personal views of a renowned scientist who introduced many new ideas on tablet bonding in the pharmaceutical field during his long career. Another article deals with bonding mechanisms and disagrees, in some respects, with the review article. Other research articles are concerned with the measurement of tablet strength, the percolation theory and the analysis of compression cycles of materials. Finally, a new practical index to predict capping is described in a technical note.

We are grateful to all the authors for their contributions and we hope that this issue will stimulate discussion and research in the discipline.

Eric Doelker
University of Geneva

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