Claims:

1. A dry powder inhalation system comprising:
   a breath-activated dry powder inhaler; and
   a cartridge containing medicament,

wherein the medicament comprises a diketopiperazine and an active agent;

said breath-activated dry powder inhaler comprising air conduits configured to have a predetermined airflow distribution around through said cartridge operably configured to mix the medicament with air forming a powder plume for delivery to a patient's pulmonary system; wherein said predetermined airflow distribution through said cartridge ranges from about 10 to 30% of airflow volume entering said breath-activated dry powder inhaler, and wherein the breath-activated dry powder inhaler is structurally configured to effectuate an airflow resistance tunable to a resistance value between 0.08 and 0.15 √kPa/liters per minute.

2. The dry powder inhalation system of claim 1 wherein a cross-sectional area at a section of the air conduits is varied to tune the resistance value between 0.08 and 0.13 √kPa/liters per minute.

3. The dry powder inhalation system of claim 1, wherein the diketopiperazine is fumaryl diketopiperazine.

4. The dry powder inhalation system of claim 1, wherein the active agent is selected from the group consisting of a peptide, a protein, and a hormone of naturally-occurring or synthetic origin, or analogs thereof.

5. The dry powder inhalation system of claim 4, wherein the peptide or the protein is insulin, parathyroid hormone, GLP-1, or parathyroid hormone related protein (PTHrP).

6.. The dry powder inhalation system of claim 1, wherein the cartridge comprises a structure with a defined shape having a wall with one or more apertures having a closed configuration or open configuration, an outer surface and an inner surface defining an internal volume; and said

closed configuration restricts communication to said internal volume and said open configuration forms an air passage through said internal volume.