Indolin derivatives and use thereof

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Market Needs: Fibrosis diseases, which can affect major organs like the lungs, kidneys, and heart, pose a severe threat to patients' lives. For example, idiopathic pulmonary fibrosis has unclear incidence and prevalence rates but a survival time of only 2-5 years after diagnosis. Similarly, kidney fibrosis is common in late-stage chronic kidney diseases. New drugs are urgently needed as existing treatments are inadequate. According to estimates, the global market for idiopathic pulmonary fibrosis is expected to reach $6.17 billion by 2030, with a compound annual growth rate of 7%, while the demand for end-stage kidney disease is expected to reach $270 billion by 2030, with a compound annual growth rate of 13.4%.

Our Technology: The lead compound is highly selective for CDK8 and strongly inhibits its activity (IC_{50} 16 nM). It has demonstrated sound inhibitory effects on diseases such as idiopathic pulmonary fibrosis, kidney fibrosis, and cancer metastasis in both in vivo and in vitro experiments. It has excellent development value as it outperforms current clinical drugs for these diseases.

Strength: Deleting the CDK8 gene in adult animals does not impact immune or blood function, indicating that CDK8 inhibitors are unlikely to cause severe side effects. The lead compound has high selectivity for CDK8 and potent inhibitory effects, which minimizes the risk of side effects.

Competing Products: There are currently no CDK8 inhibitors on the market. RVU120 (Ryvu Therapeutics) and BCD-115 (Biocad) are the only two CDK8 inhibitors in phase II and phase I clinical trials, respectively, for acute myeloid leukemia and ER (+) Her2 (-) breast cancer metastasis. Still, they have not been studied for use in fibrotic diseases. However, studies have shown that these two competitors have drawbacks, such as metabolic instability and poor CDK8 selectivity, which increases the risk of side or off-target effects.

Intellectual Properties: (1) This technology will apply for patents in Taiwan and the United States. (2) The research team has over ten years of experience in drug research and has obtained multiple domestic and international patents, such as Taiwan patents I659949, I761471, I398277, and I396533 in recent years, as well as international patents in the United States, Japan, South Korea, the European Union, the United Kingdom, France, Germany, Switzerland, Australia, India, etc.

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