

**Table S1.** Deacetylase inhibitors entering clinical trials.

| Compound     | Target       | Mechanism                                                                                                                     | Clinical stage | Indications                    | ClinicalTrials.gov ID |
|--------------|--------------|-------------------------------------------------------------------------------------------------------------------------------|----------------|--------------------------------|-----------------------|
| Citarinostat | HDAC6        | Suppress the function of HDAC6 and hinder cell growth.                                                                        | Phase I        | Multiplemyeloma                | NCT02886065           |
| AR-42        | Pan HDACs    | Reduce the levels of histone acetylation and diminish Akt pathway activity.                                                   | Phase I        | Advanced cancer                | NCT02886066           |
| Tasquinimod  | HDAC4        | Function through the allosteric blockade of HDAC4 signaling pathways.                                                         | Phase II       | Hepatocellular, Ovarian, Renal | NCT01743469           |
| CXD101       | HDAC class I | Suppress the enzymatic action of HDACs 1, 2, and 3.                                                                           | Phase I        | Cell and Gastric Cancers       | NCT01977638           |
| KA2507       | HDAC6        | Suppress the function of HDAC6 and exhibit anti-cancer properties as well as immune system regulation in preclinical studies. | Phase I        | Advanced Cancer                | NCT03008018           |

|                             |                        |                                                                                                               |                  |                                                                    |             |
|-----------------------------|------------------------|---------------------------------------------------------------------------------------------------------------|------------------|--------------------------------------------------------------------|-------------|
| 4-<br>Phenylbutyric<br>acid | Pan<br>HDACs           | Block the histone<br>deacetylase activity<br>and ER stress<br>triggered by SiNPs<br>within RAW264.7<br>cells. | Phase<br>II, III | Lymphoma, adult<br>solid tumors                                    | NCT04531879 |
| Tinostamustin<br>e          | HDAC<br>class I,<br>II | Promote the addition<br>of acetyl groups to<br>histone or nonhistone<br>proteins.                             | Phase I,<br>II   | Numerous Solid<br>Tumors                                           | NCT03345485 |
| Domatinostat                | HDAC<br>class I        | Stimulate the<br>acetylation process of<br>H3 histone proteins.                                               | Phase<br>II      | GastrointEstinal<br>Cancers                                        | NCT03812796 |
| CI-994                      | Pan<br>HDACs           | Suppress the<br>enzymatic function of<br>HDAC1, 2, 3, and 8,<br>as well as curb cell<br>proliferation.        | Phase<br>II      | Advanced<br>Myeloma                                                | NCT00005624 |
| Entinostat                  | HDAC1,<br>3            | Suppress the function<br>of HDAC1 and<br>HDAC3, thereby<br>triggering cell<br>autophagy and<br>apoptosis.     | Phase<br>II      | Relapsed or<br>Refractory<br>Hodgkin's<br>Lymphoma(ENG<br>AGE-501) | NCT00866333 |
| Givinostat                  | Pan                    |                                                                                                               | Phase            | Duchenne                                                           | NCT03373969 |

|              |                                |                                                                                                       |                |                                                             |             |
|--------------|--------------------------------|-------------------------------------------------------------------------------------------------------|----------------|-------------------------------------------------------------|-------------|
|              | HDACs                          |                                                                                                       | III            | muscular<br>dystrophy (DMD)                                 |             |
| Abexinostat  | Pan<br>HDACs                   | It exhibits greater<br>specificity for<br>HDAC6 and HDAC8.                                            | Phase<br>III   | Recurrent Glioma                                            | NCT05698524 |
| Tucidinostat | HDAC<br>class I,<br>HDAC1<br>0 | Facilitate the<br>acetylation process of<br>the H3 protein.                                           | Phase<br>II    | Metastatic Triple-<br>negative Breast<br>Cancer             | NCT05390477 |
| Panobinostat | Pan<br>HDACs                   | Suppress the buildup<br>of acetylated histone<br>and nonhistone<br>proteins, triggering<br>autophagy. | Phase I,<br>II | MDS/AML                                                     | NCT01451268 |
| Belinostat   | Pan<br>HDACs                   | Suppress the buildup<br>of acetylated histone<br>and nonhistone<br>proteins, triggering<br>autophagy. | Phase I        | Mild, Moderate<br>and Severe Renal<br>Impairment            | Nct02679132 |
| Romidepsin   | Pan<br>HDACs                   | Suppress the activity<br>of HDAC1 and<br>HDAC2, facilitating<br>cellular apoptosis.                   | Phase<br>II    | Progressive or<br>Relapsed<br>Peripheral T-cell<br>Lymphoma | NCT00426765 |
| Vorinostat   | Pan<br>HDACs                   | Halt the accumulation<br>of acetylated histone<br>and nonhistone<br>proteins.                         | Phase<br>II    | Lower Risk<br>Myelodysplastic                               | NCT00486721 |