Avicins and thioesterification to control protein function

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Value Proposition

Thioesterification agents can modify cysteine groups of signaling proteins in order to modify their activity. Pathologies that could benefit from such protein modifications, which modulate physiologic redox status, include atherosclerosis, cancer, bacterial infections, inflammation, and neurological disorders. Therefore, thioesterification of signaling proteins could serve as a novel therapy for redox associated pathologies. Such thioesterification agents can enter a global protein therapeutic market expected to increase at a compound annual growth rate of 7.3% to $248.7 billion by 2020.

Technology

The invention provides compositions that reversibly modify cysteine residues of signaling proteins through thioesterification. These compositions such as Avicins, can be developed into targeting agents to treat redox associated pathologies by modifying cysteine on signaling proteins. Furthermore, these agents could bind to and supplement a broad range of therapeutic agents, including antibodies, bacterial proteins, and neurological agents, by leading them to their target proteins. The inventors have demonstrated the transesterification of OxyR by avicins and elucidated the structural basis of this interaction *in situ* (right).

Advantages

- Novel agent that can drive the development of new potential therapies for redox state associated pathologies, via a heretofore unexplored mechanism.
- *In situ* data highlighting merits and feasibility of invention as a therapeutic agent.
- Technology whose applications can expand with further research, and therefore lends itself to a potentially large addressable market in a growing therapeutic space.