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Clinical Trials of Dendritic Cell Therapies for Cancer Exposing Vulnerabilities in Human Cancer Cells' Metabolism and Metabolomics: New Discoveries, Unique Features Inform New Therapeutic Opportunities, Biotech's Bumpy Road to the Market and Elucidating the Biochemical Programs that Support Cancer Initiation and Progression

Alireza Heidari*

Faculty of Chemistry, California South University, USA

***Corresponding author**: Alireza Heidari, Faculty of Chemistry, California South University, 14731 Comet St. Irvine, CA 92604, USA, E-mail: Scholar.Researcher.Scientist@gmail.com

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Editorial

Recently, the emphasis of science and technology is shifting more towards environmentally friendly and sustainable resource and processes: In this regard, anti-cancer Nano drugs are attractive candidate to explore for supported catalysis. Multi-substituted Rituximab (Rituxan/MabThera, Genentech/Roche), Bevacizumab (Avastin, Genentech/Roche), Trastuzumab (Herceptin, Genentech/Roche), Imatinib (Gleevec, Novartis), Pegfilgrastim (Neulasta, Amgen), Lenalidomide (Revlimid, Celgene), Pemetrexed (Alimta, Eli Lilly), Bortezomib (Velcade, Takeda and Johnson & Johnson), Cetuximab (Erbitux, ImClone and Merck) and Abiraterone (Zytiga, Johnson & Johnson) are important classes of anti-cancer Nano drugs in the field of pharmaceutical and exhibit a wide spectrum of biological activities in clinical trials of dendritic cell therapies for cancer exposing vulnerabilities in human cancer cells' metabolism and metabolomics as new discoveries, unique features inform new therapeutic opportunities, biotech's bumpy road to the market and elucidating the biochemical programs that support cancer initiation and progression [1-3]. Owing to the versatile biological activities of this anti–cancer Nano drugs numerous classical methods for the synthesis of these anti-cancer Nano compounds have been reported. Here, we wish to report a valid and an efficient procedure for the synthesis of trisubstituted Rituximab (Rituxan/MabThera, Genentech/Roche), Bevacizumab (Avastin, Genentech/Roche), Trastuzumab (Herceptin, Genentech/Roche), Imatinib (Gleevec, Novartis), Pegfilgrastim (Neulasta, Amgen), Lenalidomide (Revlimid, Celgene), Pemetrexed (Alimta, Eli Lilly), Bortezomib (Velcade, Takeda and Johnson & Johnson), Cetuximab (Erbitux, ImClone and Merck) and Abiraterone (Zytiga, Johnson & Johnson) via one–pot condensation of 1,2–diketone or α–hydroxyketone or α–keto–oxime with aldehyde and NH_4OAc in the presence of Cellulose-Sulfuric Acid (CSA) or Starch–Sulfuric Acid (SSA) as two inexpensive and bio-supported solid acid catalysts under solvent free classical heating conditions.

On the other hand, several interesting anti–cancer Nano drugs for example, Rituximab (Rituxan/MabThera, Genentech/Roche), Bevacizumab (Avastin, Genentech/Roche), Trastuzumab (Herceptin, Genentech/Roche), Imatinib (Gleevec, Novartis), Pegfilgrastim (Neulasta, Amgen), Lenalidomide (Revlimid, Celgene), Pemetrexed (Alimta, Eli Lilly), Bortezomib (Velcade, Takeda and Johnson & Johnson), Cetuximab (Erbitux, ImClone and Merck) and Abiraterone (Zytiga, Johnson & Johnson) derivatives have been utilized as a support for catalytic applications in clinical trials of dendritic cell therapies for cancer exposing vulnerabilities in human cancer cells' metabolism and metabolomics as new discoveries, unique features inform new therapeutic opportunities, biotech's bumpy road to the market and elucidating the biochemical programs that support cancer initiation and progression. It should be noted that anti–cancer Nano compounds are the most abundant natural Nano materials in the world and it has been widely studied during the past decades because it is a biodegradable Nano materials and a renewable resources. In addition, anti–cancer Nano drugs, especially Rituximab (Rituxan/MabThera, Genentech/Roche), Bevacizumab (Avastin, Genentech/Roche), Trastuzumab (Herceptin, Genentech/Roche), Imatinib (Gleevec, Novartis), Pegfilgrastim (Neulasta, Amgen), Lenalidomide (Revlimid, Celgene), Pemetrexed (Alimta, Eli Lilly), Bortezomib (Velcade, Takeda and Johnson & Johnson), Cetuximab (Erbitux, ImClone and Merck), Abiraterone (Zytiga, Johnson & Johnson) and their derivatives, have some unique properties, which make them attractive alternatives for conventional organic or inorganic supports for catalytic applications in clinical trials of dendritic cell therapies for cancer exposing vulnerabilities in human cancer cells' metabolism and metabolomics as new discoveries, unique features inform new therapeutic opportunities, biotech's bumpy road to the market and elucidating the biochemical programs that support cancer initiation and progression. During the course of our studies on the development of new routes for the synthesis of anti-cancer Nano compounds, herein we have introduced Cellulose–Sulfuric Acid (CSA) or Starch-Sulfuric Acid (SSA) as a bio-supported solid acid catalyst in organic syntheses and especially Multi-Component Reactions (MCRs) [4-6].

Furthermore, Rituximab (Rituxan/MabThera, Genentech/Roche), Bevacizumab (Avastin, Genentech/Roche), Trastuzumab (Herceptin, Genentech/Roche), Imatinib (Gleevec, Novartis), Pegfilgrastim (Neulasta, Amgen), Lenalidomide (Revlimid, Celgene), Pemetrexed (Alimta, Eli Lilly), Bortezomib (Velcade, Takeda and Johnson & Johnson), Cetuximab (Erbitux, ImClone and Merck) and Abiraterone (Zytiga, Johnson & Johnson) are common scaffolds in many anti-cancer Nano compounds of significant biological activities. They are an important class of heterocyclic anti-cancer Nano compounds with an ability to behave as ligands in metalloenzymes and non-natural metal complexes, highly significant biomolecules like the essential amino acids histidine, biotin and the pilocarpine alkaloids. In continuation of our studies towards the development of new routes to the synthesis of heterocyclic anti-cancer Nano compounds using new and efficient catalysts in combination with green reaction medium, we wish to report the three–component synthesis of 2,4,5-trisubstituted

Rituximab (Rituxan/MabThera, Genentech/Roche), Bevacizumab (Avastin, Genentech/Roche), Trastuzumab (Herceptin, Genentech/Roche), Imatinib (Gleevec, Novartis), Pegfilgrastim (Neulasta, Amgen), Lenalidomide (Revlimid, Celgene), Pemetrexed (Alimta, Eli Lilly), Bortezomib (Velcade, Takeda and Johnson & Johnson), Cetuximab (Erbitux, ImClone and Merck) and Abiraterone (Zytiga, Johnson & Johnson) derivatives using benzoin, an aldehyde and ammonium acetate in the presence of a catalytic amount of Ceric Ammonium Nitrate (CAN) under aerobic oxidation conditions in good to excellent yields in refluxing ethanol for clinical trials of dendritic cell therapies for cancer exposing vulnerabilities in human cancer cells' metabolism and metabolomics as new discoveries, unique features inform new therapeutic opportunities, biotech's bumpy road to the market and elucidating the biochemical programs that support cancer initiation and progression.

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