Cancer Vaccines: A Ray of Hope

Lipika Chablani
St. John Fisher College, lchablani@sjfc.edu

How has open access to Fisher Digital Publications benefited you?

Follow this and additional works at: http://fisherpub.sjfc.edu/pharmacy_facpub

Part of the Pharmacy and Pharmaceutical Sciences Commons

Publication Information
Please note that the Publication Information provides general citation information and may not be appropriate for your discipline. To receive help in creating a citation based on your discipline, please visit http://libguides.sjfc.edu/citations.

This document is posted at http://fisherpub.sjfc.edu/pharmacy_facpub/99 and is brought to you for free and open access by Fisher Digital Publications at St. John Fisher College. For more information, please contact fisherpub@sjfc.edu.
Cancer Vaccines: A Ray of Hope

Abstract
In lieu of an abstract, here are the article's first two paragraphs:

Recent cancer statistics review by Surveillance, Epidemiology, and End Results (SEER) Program by National Cancer Institute (NCI) shows that cancer is the second most leading cause of death after heart diseases. Cancer incidence has grown from 19.2% to 23.3% from 1975 to 2010 (Figure 1)[1]. Lung cancer remains to be the most fatal form of cancer followed by colorectal, breast and prostate cancer in the country (Table 1)[1]. Regardless of several treatment options, cancer remains to be a unique challenge for both patients and the healthcare providers. Several treatment options are available to address this disease now. Chemotherapy, surgery, radiation therapy are still the mainline of treatment plan for cancer patients. Along with these therapies, immunotherapy is being explored as a combination therapy. Immunotherapy allows utilization of patient’s own immune system to combat the disease and/or assist in avoiding a relapse.

Cancer research and clinical trials are one of the most challenging ones attributed to the nature of the disease state. This editorial is devoted to those, who have dedicated their careers to develop various immunotherapeutic approaches leading to the evolution of cancer vaccines, providing a ray of hope to cancer patients. These cancer vaccines are targeted to boost the immune response of the host further protecting them from the challenges posed by cancerous cells. Unlike vaccines for infectious diseases, a cancer vaccine is targeted against host’s own cells. Thus, identification and isolation of such cancer antigens is not only difficult but also unique for the patient at times.

Disciplines
Pharmacy and Pharmaceutical Sciences

Comments
This article can also be found through the publisher’s webpage.

Creative Commons License
This work is licensed under a Creative Commons Attribution 4.0 License.

This article is available at Fisher Digital Publications: http://fisherpub.sjfc.edu/pharmacy_facpub/99
Cancer Vaccines: A Ray of Hope

Lipika Chablani*
Department of Pharmaceutical Sciences, Wegmans School of Pharmacy, USA

*Corresponding author: Lipika Chablani, Department of Pharmaceutical Sciences, Wegmans School of Pharmacy, St. John Fisher College, Rochester, NY 14618, Tel: 15855993714; Email: lchablani@sjfc.edu

Received: December 17, 2013; Accepted: January 10, 2014; Published: January 12, 2014

As we put forth the inaugural issue of Austin Journal of Cancer and Clinical Research, I would like to take this opportunity to welcome the readers and encourage fellow peers in academia, industry, government and related healthcare professionals to contribute their research work and expert reviews to the journal.

Recent cancer statistics review by Surveillance, Epidemiology, and End Results (SEER) Program by National Cancer Institute (NCI) shows that cancer is the second most leading cause of death after heart diseases. Cancer incidence has grown from 19.2% to 23.3% from 1975 to 2010 (Figure 1)[1]. Regardless of several treatment options, cancer remains to be a unique challenge for both patients and the healthcare providers. Several treatment options are available to address this disease now. Chemotherapy, surgery, radiation therapy are still the mainline of treatment plan for cancer patients. Along with these therapies, immunotherapy is being explored as a combination therapy. Immunotherapy allows utilization of patient’s own immune system to combat the disease and/or assist in avoiding a relapse.

Cancer research and clinical trials are one of the most challenging ones attributed to the nature of the disease state. This editorial is devoted to those, who have dedicated their careers to develop various immunotherapeutic approaches leading to the evolution of cancer vaccines, providing a ray of hope to cancer patients. These cancer vaccines are targeted to boost the immune response of the host further protecting them from the challenges posed by cancerous cells. Unlike vaccines for infectious diseases, a cancer vaccine is targeted against antigens derived from cancer cells. Various limitations of being eligible for the therapy, the cost and effort required to conduct the procedure, reduced the number of patients being benefited by this therapeutic effect. Sipuleucel-T based clinical trials have resulted in an increase in survival rate of men suffering from metastatic prostate cancer by an average of four months. Various limitations of being eligible for the therapy, the cost and effort required to conduct the procedure, reduced the number of patients being benefited by this therapeutic vaccine.

Considering the potential of these cancer vaccines, various ongoing clinical trials are utilizing different approaches to develop cancer vaccines. Some of the antigen sources for these vaccines are:

- Viral antigens
- Whole cell lysates of cancer cells/weakened cancer cells
- Protein/carbohydrate/glycolipid/ganglioside based cancer antigens derived from cancer cells
- DNA/RNA fragments responsible for tumor associated antigens (TAA)

Various immunostimulants/adjuvants have been employed to enhance the immune response against these antigens, some examples

<table>
<thead>
<tr>
<th>Common Types of Cancer</th>
<th>Estimated New Cases 2013</th>
<th>Estimated Deaths 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Cancer Sites</td>
<td>1,660,290</td>
<td>580,350</td>
</tr>
<tr>
<td>1. Lung and Bronchus Cancer</td>
<td>228,190</td>
<td>159,480</td>
</tr>
<tr>
<td>2. Colon and Rectum Cancer</td>
<td>142,820</td>
<td>50,830</td>
</tr>
<tr>
<td>4. Prostate Cancer</td>
<td>238,590</td>
<td>29,720</td>
</tr>
<tr>
<td>5. Non-Hodgkin Lymphoma</td>
<td>69,740</td>
<td>19,020</td>
</tr>
<tr>
<td>6. Bladder Cancer</td>
<td>72,570</td>
<td>15,210</td>
</tr>
<tr>
<td>7. Kidney and Renal Pelvis Cancer</td>
<td>65,150</td>
<td>13,680</td>
</tr>
<tr>
<td>8. Melanoma of the Skin</td>
<td>76,690</td>
<td>9,480</td>
</tr>
<tr>
<td>9. Endometrial Cancer</td>
<td>49,560</td>
<td>8,190</td>
</tr>
<tr>
<td>10. Thyroid Cancer</td>
<td>60,220</td>
<td>1,850</td>
</tr>
</tbody>
</table>
include: granulocyte-macrophage colony-stimulating factor (GM-CSF), Bacillus Calmette-Guérin (BCG), cytosine phosphate-guanine (CpG), interleukin-2/ interleukin-12, mono-phosphoryl lipid A (MPL), etc[2].

With several promising cancer vaccine based clinical trials in the pipeline, we continue to explore the potential of developing another line of therapy for cancer patients. With this, I congratulate Austin Journal of Cancer and Clinical Research for the inaugural issue and encourage the readers to contribute to the scientific community through the journal.

References