

## Oncolytic viral therapy

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Madam, this year; 1,685,210 people are expected to be diagnosed with cancer and about 595,690 people to die of it in USA alone.<sup>1</sup> It's even more alarming that these figures are greater than the combined stats of diagnosed cancers and cancer related mortalities from 2008-2012.<sup>1</sup> Conventionally cancers are treated using chemotherapy, radiation therapy and surgery which can impose devastating side-effects and recurrence is often seen.

In the early twentieth century the idea of the virus being a potential antineoplastic agent was being explored, after observing cases of short lived remissions in cancer patients following viral infections.<sup>2</sup> It wasn't until late twentieth century that fundamental understanding of virus was established, thus it was from this point forward that research efforts in establishing Virotherapy gained momentum,<sup>2</sup> which uses a genetically modified virus to treat cancers.

This therapy operates by two methods, lysis<sup>3</sup> and by invoking immune responses.<sup>4</sup> In the former, it preferentially invades the cancer cells and causes them to burst open, and then the latter tags in, releasing antigens which are presented to T cells<sup>5</sup> which instigate an immune response. The outstanding characteristic of this therapy is its ability to target cancer stem cells which previous conventional therapies have failed to target.<sup>4,6</sup> This treatment faces the challenge posed by the morphological and genetic heterogeneity that tumour cells flaunt, however using microarray technologies and proteomics, together with transcriptional targeting, its ability to preferentially target neoplastic cells and spare the normal ones.<sup>3</sup>

Lmlygic (uses Herpes Simplex Virus)<sup>7</sup> is one such therapy which treats melanoma, approved by FDA. But one of the most impressive and bizarre examples is the role of polio virus against Glioblastoma<sup>8</sup> which is currently being put

through clinical trials in Duke University, but has shown positive results in stages as early as Phase 0. This also promises us a solution to cancers which have poor prognosis such as pancreatic adenocarcinoma.

Oncolytic therapy proposes a fundamental shift in cancer treatments, potentially changing the demographics of mortality due to cancers and its incidences and may ensure provision of a treatment that is safer and less terrifying. Thus it's a desperate domain of research which can help us uncover successful anti-neoplastic biotherapeutic agents and to understand its mechanism of action to establish a well founded and effective system of research. Possible solutions are in the line, it is just the matter of effort of reeling it in.

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