

How Radio labeling is Helping Researchers Combat Covid 19

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ABSTRACT

Want to learn more about radiolabeling? Here's how radiolabeling is helping medical researchers combat Covid 19.

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Introduction

Covid 19 has taken the world by storm, disrupting people's health and livelihood. No one could have predicted the effects it would have on the world's economy as supply chains got severed, companies started downsizing to stay afloat, and work from home became the new norm. Since the virus broke out, scientists and researchers have been struggling hard to understand its mode of transmission, how it affects the host, and ways to combat the virus.

Given the severity of the infection, exploring the use of creative tools and techniques may be our only chance of mitigating the spread of the virus. One such tool is radiolabeling. Here's how radiolabeling is helping researchers combat covid 19.

What is Radiolabeling and How does it Work?

As its name implies, it is a technique used to "label" or mark molecules. Once molecules are marked, they can be tracked through biological processes and pathways, enabling researchers to study their interactions with other molecules. Radiolabeling is widely used in pharmacology to determine the mode of delivery, effectiveness, and adverse effects of drugs.

The technique involves the use of radioactive isotopes of different atoms like Carbon-14, Iodine-131, and Tritium-3 as part of the resultant molecule being tracked. The atoms can form an intrinsic part of the molecule, keeping its structure identical to unmarked variants or replace segments of the molecule that won't affect its study. Depending on the molecule being studied, either or both of the radiolabeling formulation methods may need to be employed.

Owing to the excess number of neutrons in their nucleus, these isotopes are unstable and release energy in the form of radiation when they undergo radioactive decay. This radiation can then be observed by employing medical imaging technology like positron emission tomography (PET) or computer tomography (CT) scans.



Figure 1.

An image of a laboratory technician taking a sample of a red substance using a pipette

How is Radiolabeling Helping Covid Researchers?

In pharmacology, radiolabeling is being used to study the effectiveness of antiviral drugs. These drugs include a portion that includes molecules that are marked via radiolabeling. These drugs are then administered to a sample of the virus or pathogen where they attach to the pathogen. Subsequent imaging scans

reveal if the drug interacts with the pathogen or not and if it is successful in inhibiting its function.

Additionally, small doses can be injected into living hosts to see how the drug interacts with pathogens and which cells and tissues it targets other than the virus. This information can be useful in determining the adverse effects of the drug and how long it stays within the biological systems.

The technology is also viable for use in marking antibodies. Antibodies are the proteins produced by our body's white blood cells in response to an antigen. They attach to the body of antigen, impairing its function or clumping them together for other white blood cells to swallow and dissolve. Using radiolabeling, we can determine which antibodies are effective at combating Covid-19 and its variants, allowing us to formulate vaccines.