

**Attention Scientists: New Lung  
Cancer Treatment Needed**

A patient has lung cancer and she has tried various treatments to cure her cancer including chemotherapy and homeopathic therapies. Her cancer is very resistant to traditional treatments. A **new cancer drug** has been developed and looks very promising for curing lung cancer resistant to current treatments. However, this drug is very harmful to many internal organs including the liver, intestines and brain. **This drug may pass through the blood stream but needs to remain only in the lungs so that it only harms the cancer tumor and not other organs.** It is our hope as doctors that we can take this drug and find a method to administer it to the lungs without damaging other organs. We are very confident in your abilities as scientists to help us solve this problem.

Medicine or drugs can enter the lungs via the blood or the air a person breathes in. Blood flows from the heart to the lungs, back to the heart, then to the rest of the body, and again, back to the heart. Oxygen enters the lungs and oxygenates blood present in the lungs whereas carbon dioxide is released from blood and exhaled. Drugs given orally or by a needle and syringe are released into the blood. Inhalers allow drugs to enter the lungs, but it is possible for drugs to eventually get absorbed into the blood.

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**BRAINSTORMING**

1. Look at the items in your box. Explore their properties and fill out the chart below. For each item write under “Pros” at least one helpful property the item has that will help your group solve the problem. For each item write under “Cons” at least one property the item has that will not help your group solve the problem

Item	Pros	Cons
Gel-cap		
Inhaler		
Syringe		
Fluid A		
Fluid B		
Magnet		

2. Use your completed chart and handout to help your group solve the problem of delivering harmful cancer drugs to the lungs only. Remember that the lung is an area where blood that circulates throughout the body comes in contact with air we breathe. **What method does your group propose to deliver this cancer drug?** You may use words or pictures to describe your method.
  
3. Explain why your method would work the best.