

<p>Card 1 All cells require energy, which they obtain by cellular respiration. Attach a green activator to the gene for the cell respiration enzyme in all cell types. This will increase production of the cell respiration enzyme. For cell respiration in smooth muscle, which needs more energy than most cell types, add a second activator to the gene.</p>	<p>Card 2 Your cell has enough ribosomes for now. Attach a red repressor to the gene for the ribosomal protein. This will decrease production of the ribosome protein.</p>
<p>Card 3 After a meal full of protein and fats, a person's body needs more enzymes to break down the fat and protein. Add a green activator to the gene for the fat and protein breakdown enzyme in all cells.</p>	<p>Card 4 There is milk, which contains lactose, in the small intestines. The lactase gene is expressed in the intestinal lining cells. Remove any red suppressors, and attach a green activator to the lactase gene. This will increase production of the lactase enzyme.</p>
<p>Card 5 There is no milk in the small intestine. The lactase gene is repressed in the intestinal lining cells. Remove any green activators, and attach a red suppressor to the gene for lactase. This will decrease production of the lactase enzyme.</p>	<p>Card 6 Proteins are needed for a cell to function. The protein synthesis initiator gene is expressed in all cells. Add a green activator to this gene for all cell types.</p>
<p>Card 7 The pancreatic beta cell has released its insulin, and more is needed. Remove any red repressors, and add a green activator to the insulin gene. This will turn on production of insulin.</p>	<p>Card 8 The pancreatic beta cell currently has enough insulin. Remove any green activators, and add a red repressor to the insulin gene of the beta cell.</p>
<p>Card 9 The smooth muscle cell is about to start a new cell cycle, when it will replicate its DNA and divide. Add a green activator to the DNA repair protein gene and a red suppressor to the cell growth control gene.</p>	<p>Card 10 The intestinal lining cell and the maturing red blood cell do not need to divide ever again. Add a green activator to the cell-cycle control gene, which will produce a protein that prevents the cell from dividing.</p>

<p>Card 11 The smooth muscle cell is growing and must produce actin. Add a green activator to the actin gene of the smooth muscle cell.</p>	<p>Card 12 The developing red blood cell must make a large amount of hemoglobin. Attach two green activators to the gene for hemoglobin to indicate that this gene must be highly expressed.</p>
<p>Card 13 The person's last few meals were high in carbohydrates, but moderate in fat and protein. In all cells, remove any green activators from the gene for the fat and protein breakdown enzyme. The cell will continue to produce small amounts of the enzyme</p>	<p>Card 14 The smooth muscle cell is mature, and only needs to produce small amounts of actin to help with muscle contractions. Remove all activators and repressors from this gene, which will continue to direct production of small amounts of actin.</p>