

## Sirolimus

Sirolimus, also known as rapamycin, is an immunosuppressant that primarily works as an mTOR inhibitor. It inhibits T-cell activation and B-cell differentiation.

Sirolimus is typically used in drug eluting stents to reduce stenosis and for kidney transplant rejection prophylaxis. Notable side effects include pancytopenia, insulin resistance, and hyperlipidemia.



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### Mechanism

#### mTOR Inhibitor

##### [M-Tornado with Inhibiting-chains](#)

Sirolimus is an mTOR inhibitor. It binds to FK506 binding protein (FKBP) which leads to the inhibition of mTOR kinase. mTOR is mechanistic / mammalian target of rapamycin.

#### Inhibits T-cell Activation

##### [Tennis-ball Activated with Inhibiting-chains](#)

Sirolimus functions as a proliferation signal inhibitor by targeting the mTOR signaling pathway, an important stimulator of cell growth and proliferation. Sirolimus binds to FKBP, forming a complex that inhibits mTOR. This leads to interruption of IL-2 signal transduction, which decreases T-cell activation.

#### Inhibits B-cell Differentiation

##### [Different Basketballs with Inhibiting-chains](#)

By inhibiting the mTOR signaling pathway, Sirolimus leads to interruption of IL-2 signal transduction, preventing G1 to S phase progression and B cell differentiation. Inhibition of B-cell differentiation leads to decreased production of IgM, IgG, and IgA antibodies.

### Indications

#### Drug Eluting Stents

##### [Stent-tube with Med-bottles](#)

Sirolimus is used in drug-eluting stents which decreases restenosis but increases thrombosis risk.

#### Kidney Transplant Rejection Prophylaxis

##### [Kidney on Train-plant with Purple-axes](#)

Sirolimus is used in kidney transplant patients to prevent rejection. As rejection is an autoimmune process that is often mediated by T cells, their inhibition by sirolimus decreases the incidence of rejection.

### Side Effects

### **Pancytopenia**

[Pan-side-toe-peanut](#)

Sirolimus can cause pancytopenia, which is a decrease in the number of all blood cell types (white blood cells, red blood cells, and platelets).

### **Insulin Resistance**

[Insect-syringe swatted by Resistance](#)

Chronic use of sirolimus can cause insulin resistance.

### **Hyperlipidemia**

[Hiker-lips](#)

Sirolimus can lead to hyperlipidemia and an increased risk of cardiovascular disease.