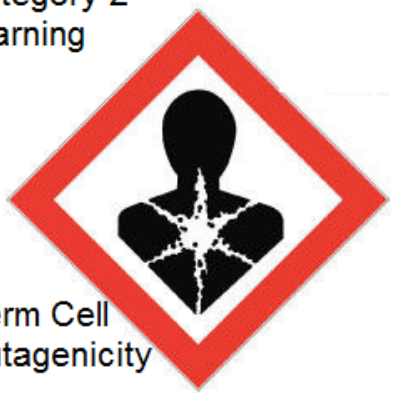
Chemical Safety Practices Recommendations
Rapamycin (Sirolimus)

Exposure Hazards (1)

Category 2 Warning  	Category 2 Warning  	Category 1 Danger Toxic 
Suspected of Causing Genetic Defects	Suspected of Damaging Fertility or the Unborn Child	Causes Damage to Immune System and Hematopoietic system.(2)

Response to Exposure

Oral	Dermal	Inhalation	Injection
Rinse mouth; do not induce vomiting. Report to OHS.	Wash skin with soap and water for 15 minutes. Rinse eyes for 15 minutes. Report to OHS.	Leave area; go to clean air. Report to OHS.	Report to OHS.

Special Precautions	Pregnant women should be extra cautious when working with Rapamycin. (3) Liver damage or disease may increase the effects of Rapamycin.(4) Discard garments as hazardous if contaminated with Rapamycin.
Personal Protective Equipment	Gloves (Double glove) (Latex or Nitrile) Skin Protection (Suit or Scrubs or Lab Coat) Eye Protection (Safety-glasses or Goggles) Closed-toe shoes Use N100 respirator if engineering controls are not available. 
Engineering Controls	Rapamycin powder- Chemical Fume Hood (CFH) (5) Rapamycin solution- CFH or Biosafety Cabinet (Class II, B2 BSC if aerosolized) Animal waste and bedding- No Special Precautions
Animal Handling	No Special Precautions. (4, 6)
Bedding Disposal	No Special Precautions.
Work Practices	Dispose of unused Rapamycin as medical waste.

References:

1. Rapamycin MSDS [Internet]. CaymanChemicalCompany. 2013 [cited 4/7/2015]. Available from: https://www.caymanchem.com/app/template/Home.vm.
2. Sacks SH. Rapamycin on trial. Nephrology, dialysis, transplantation : official publication of the European Dialysis and Transplant Association - European Renal Association. 1999;14(9):2087-9.
3. NIOSH. NIOSH list of antineoplastic and other hazardous drugs in healthcare settings 2014. Cincinnati, OH: National Institute for Occupational Safety and Health, DHHS (NIOSH), U.S. Department of Health and Human Services CfDCaP; 2014 September 2014. Report No.: 2014-138 Contract No.: 2014-138.
4. Leung LY, Lim HK, Abell MW, Zimmerman JJ. Pharmacokinetics and metabolic disposition of sirolimus in healthy male volunteers after a single oral dose. Therapeutic drug monitoring. 2006;28(1):51-61.
5. National Research Council Committee on Prudent Practices in the L. The National Academies Collection: Reports funded by National Institutes of Health. Prudent Practices in the Laboratory: Handling and Management of Chemical Hazards: Updated Version. Washington (DC): National Academies Press (US) National Academy of Sciences.; 2011.
6. Crowe A, Bruelisauer A, Duerr L, Guntz P, Lemaire M. Absorption and intestinal metabolism of SDZ-RAD and rapamycin in rats. Drug metabolism and disposition: the biological fate of chemicals. 1999;27(5):627-32.

Questions or concerns: Please contact EHS, Ted Witte, theodore.witte@nih.gov or 301-846-5860

Reviewed 04/14/2015 *These recommendations are not final and may be updated.*

Chemical Safety Practices Recommendations
Rapamycin (Sirolimus)

Rapamycin is an immunosuppresant drug used to prevent organ transplant rejection. Rapamycin binds to 'FK Binding Protein-12' and prevents T-Lymphocyte activation/proliferation and antibody production. It is also an inhibitor of mTOR and causes cells to pause in their growth cycle before replicating DNA, and so is used as a cytostatic agent. The suppression of the immune system by Rapamycin has also been shown to slightly increase the risk of developing various malignancies.

Chronic exposure may cause susceptibility to infection, embryo toxicity and/or metabolic disorders, reversible testicular damage, and various abnormalities in blood composition. Rapamycin accumulates in the fetus to higher levels than are present in the maternal blood.

Rapamycin is rapidly metabolized by CYP3A4, which is present in both the liver and the intestines. In humans virtually no active Rapamycin is excreted in the urine or feces. The intestinal metabolism of Rapamycin in rodents is similar and little to no drug will be excreted in their waste.

Questions or concerns: Please contact EHS, Ted Witte, theodore.witte@nih.gov or 301-846-5860
Reviewed 04/14/2015 *These recommendations are not final and may be updated.*