RIPA, ELISA, and CBA are common serologic tests for the diagnosis of MG[1-5]

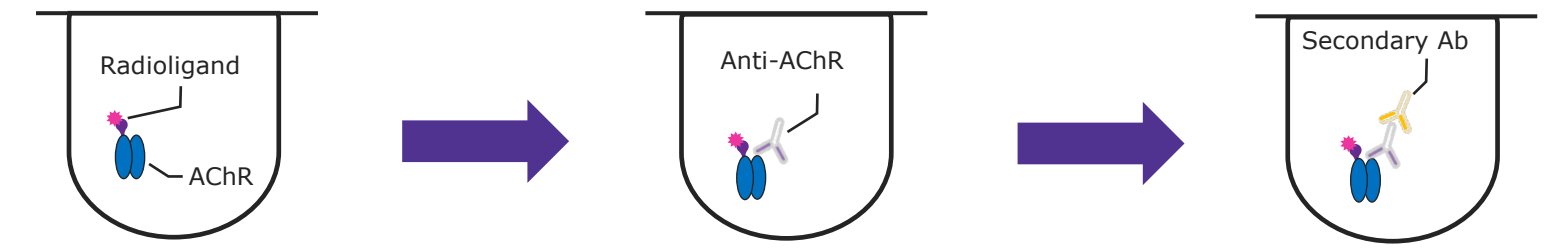
This material is provided for educational and supplemental purposes only and is not intended to replace clinical judgment. Assessment, monitoring, and diagnosis should be based on a comprehensive evaluation by the treating physician.

RIPA

Detection: Anti-AChR and anti-MuSK[1-3]

Pros
- ✓ Established assay for anti-AChR and anti-MuSK testing[1-3]
- ✓ High specificity (nearly 100%) and sensitivity (50-100%) for anti-AChR; lower sensitivity (2–3%) but similar specificity (nearly 100%) for anti-MuSK[2,6-8]

Cons
- × Radioactive labelling technique[1-3]



AChRs are labeled with ^{125}I-α-bungarotoxin → Anti-AChR targeting AChR → Secondary Ab used to precipitate AChR–^{125}I-α-bungarotoxin complex

ELISA

Detection: Anti-AChR, anti-MuSK, and anti-LRP4[1,3]

Pros
- ✓ Non-radioactive alternative to RIPA[1]

Cons
- ✓ Compared with RIPA, less specific (94–95% vs 98–100%) and sensitive (62–77% vs 64–100%) for anti-AChR[3,7,8]
- × May be more likely to generate false-positives than RIPA or CBA[9]

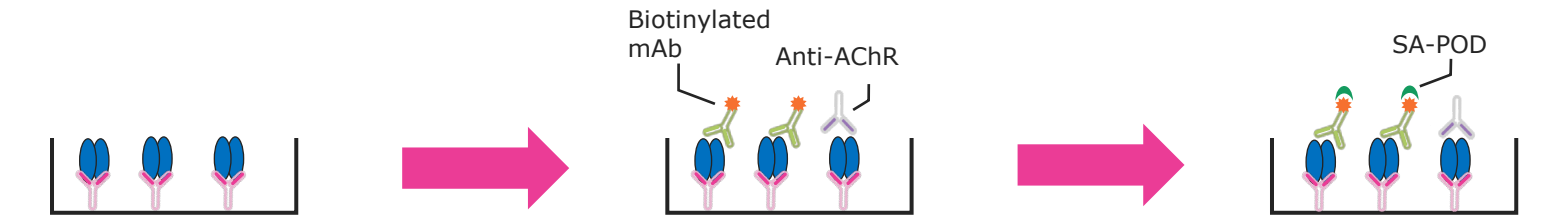


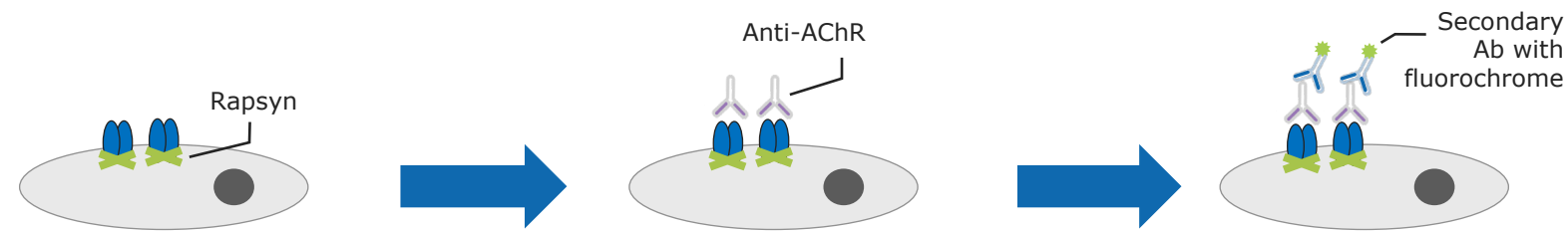
Plate coated with mAbs used to capture AChRs → Anti-AChR from serum + biotinylated mAbs compete for immobilized AChRs → Biotinylated mAb signal detected with SA-POD

CBA

Detection: Anti-AChR, anti-MuSK, anti-LRP4, and anti-agrin[1-3,10]

Pros
- ✓ Sensitive detection for anti-AChR versus RIPA and ELISA (sensitivity: 72–100% vs 64–100% and 62–77%, respectively)[6,8]
- ✓ Better mimic of antigen expressed in vivo[1]

Cons
- × Requires specialized expertise and cell culture facilities[11]
- × No commercial kits available[1,3]



HEK cell transfected with AChR and rapsyn cDNA → Anti-AChR from serum binds to clustered AChRs → Fluorochrome-labeled secondary Ab for signal detection

Sequence and type of tests for diagnosis can vary.[1,2,4] The clinician should consider the patient history and the benefits and limitations of each test.

*May therefore detect Abs in individuals who would otherwise be classified as seronegative.[1–3]

Ab, antibody; AChR, acetylcholine receptor; CBA, cell-based assay; cDNA, complementary DNA; ELISA, enzyme-linked immunosorbent assay; HEK, human embryonic kidney cell; LRP4, low-density lipoprotein receptor-related protein 4; mAb, monoclonal antibody; MG, myasthenia gravis; MuSK, muscle-specific kinase; RIPA, radio-immunoprecipitation assay; SA-POD, streptavidin-peroxidase.

1. Li Y, et al. Ann Transl Med. 2023;11(7):290. **2.** Mousavi A, et al. Clin Biochem. 2024;133–134:110826. **3.** Frykman H, et al. Front Neurol. 2020;11:596621. **4.** Zisimopoulou P, et al. Autoimmun Rev. 2013;12(9):924–930. **5.** Li Z, et al. Lancet Reg Health West Pac. 2023;38:100846. **6.** Li Z, et al. Lancet Reg Health West Pac. 2023;38:100846. **7.** Lazaridis K, Tzartos SJ. Front Immunol. 2020;11:212. **8.** Diogenes L, et al. J Neuromuscul Dis. 2024;11(3):613–623. **9.** Budhram A. Lancet Reg Health West Pac. 2023;38:1008796. **10.** Kim SH, et al. J Clin Neurol. 2025;21(2):105-112. **11.** Spagni G, et al. Neurol Neuroimmunol Neuroinflamm. 2023;10:e2000038.

US-NONNI-02463 | GL-NONNI-02607 | June 2026
This material is funded and organized by Merck KGaA, Darmstadt, Germany. EMD Serono is the healthcare business of Merck KGaA, Darmstadt, Germany, in the US and Canada.