

Datasheet: BUF012B

BATCH NUMBER 154877

Description:	alamarBlue®
Name:	alamarBlue®
Format:	Reagent
Product Type:	Accessory Reagent
Quantity:	100 ml

Product Details

Applications

This product has been reported to work in the following applications. This information is derived from testing within our laboratories, peer-reviewed publications or personal communications from the originators. Please refer to references indicated for further information. For general protocol recommendations, please visit www.bio-rad-antibodies.com/protocols.

	Yes	No	Not Determined	Suggested Dilution
ELISA	▪			
Immunofluorescence	▪			
Functional Assays	▪			

Where this product has not been tested for use in a particular technique this does not necessarily exclude its use in such procedures. Suggested working dilutions are given as a guide only. It is recommended that the user titrates the product for use in their own system using appropriate negative/positive controls.

Product Form

Liquid

Preservative Stabilisers

None present

Product Information

The cell proliferation assay reagent alamarBlue® is designed to provide a rapid and sensitive measure of cell proliferation and cytotoxicity in various human and animal cell lines, bacteria and fungi.

alamarBlue® is an indicator dye, that incorporates an oxidation-reduction (REDOX) indicator that both fluoresces and changes colour in response to the chemical reduction of growth medium, resulting from cell growth. The alamarBlue® cell proliferation assay reagent is designed to quantitatively measure the proliferation of various human and animal cell lines, bacteria and fungi.

Some variability in the absorbance may occur between batches of AlamarBlue® but all batches should fall between 0.84 and 0.95AU when measured between 600nm and 602nm on a spectrophotometer.

Full cell proliferation assay instructions can be found [here](#)

Colorimetric and Fluorescence result calculators can be found [here](#).

For further information and Technical help about alamarBlue[®], the cell proliferation assay reagent, please visit www.bio-rad-antibodies.com/alarBlue

This site includes:

Frequently Asked Questions

Example calculations

Product-related references

Test Principle

Cell proliferation assay

- Growing cells cause a chemical reduction of alamarBlue[®].
- Continued growth maintains a reduced environment. (fluorescent, red).
- Inhibition of growth maintains an oxidized environment. (non-fluorescent, blue).
- Data may be collected using either fluorescence-based or absorbance-based instrumentation.
- Fluorescence is monitored at 530-560nm excitation wavelength and 590nm emission wavelength.
- Absorbance is monitored at 570nm and 600nm.

Intended Use

- Cell proliferation assays.
- The reagent can be used to establish proliferation or relative cytotoxicity in a cell proliferation assay.
- Baseline data for predicting the toxicity of related novel agents can be compared to baseline data with known in-vivo toxicity.
- alamarBlue[®] is for use between pH6.8 and pH7.4.

Instructions For Use

Instructions for use can be found at www.bio-rad-antibodies.com/uploads/IFU/BUF012B.pdf

References

1. Lewis, C.S. *et al.* (2010) Local Antibiotic Delivery with Bovine Cancellous Chips. [J Biomater Appl. 26: 491-506.](#)
2. Alsford, S. and Horn, D. (2011) Elongator Protein 3b Negatively Regulates Ribosomal DNA Transcription in African Trypanosomes. [Mol Cell Biol.31: 1822-32.](#)
3. Crilly, A. *et al.* (2011) Phosphodiesterase 4 (PDE4) regulation of proinflammatory cytokine and chemokine release from rheumatoid synovial membrane. [Ann Rheum Dis. 70: 1130-7.](#)
4. Paget, C. *et al.* (2011) Potential Role of Invariant NKT Cells in the Control of Pulmonary Inflammation and CD8+ T Cell Response during Acute Influenza A Virus H3N2 Pneumonia. [J Immunol. 186: 5590-602.](#)
5. Lakhkar, N. *et al.* (2011) Titanium and strontium-doped phosphate glasses as vehicles for strontium ion delivery to cells. [J Biomater Appl. 25: 877-93.](#)
6. Wilson, B.A. *et al.* (2011) High-throughput screen identifies novel inhibitors of cancer biomarker α -methylacyl coenzyme A racemase (AMACR/P504S). [Mol Cancer Ther. 10: 825-38.](#)

7. Lau, L.I. *et al.* (2011) The Effect of Photooxidative Stress and Inflammatory Cytokine on Complement Factor H Expression in Retinal Pigment Epithelial Cells. [Invest Ophthalmol Vis Sci. 52: 6832-41.](#)
8. Arlian, B.M. and Tinker, J.K. (2011) Mucosal Immunization with a Staphylococcus aureus IsdA-Cholera Toxin A2/B Chimera Induces Antigen-Specific Th2-Type Responses in Mice. [Clin Vaccine Immunol. 18: 1543-51.](#)
9. Voloshin, T. *et al.* (2011) G-CSF supplementation with chemotherapy can promote revascularization and subsequent tumor regrowth: prevention by a CXCR4 antagonist. [Blood. 118: 3426-35.](#)
10. Rao, T.D. *et al.* (2011) Dual-Fluorescence Isogenic High-Content Screening for MUC16/CA125 Selective Agents. [Mol Cancer Ther. 10: 1939-48.](#)
11. Uitdehaag, J.C. *et al.* (2011) Multidimensional Profiling of CSF1R Screening Hits and Inhibitors: Assessing Cellular Activity, Target Residence Time, and Selectivity in a Higher Throughput Way. [J Biomol Screen. 16: 1007-17.](#)
12. Rzhepishevskaya, O. *et al.* (2011) The antibacterial activity of ga3+ is influenced by ligand complexation as well as the bacterial carbon source. [Antimicrob Agents Chemother. 55: 5568-80.](#)
13. Xu, S. *et al.* (2011) Marek's disease virus type 1 microRNA miR-M3 suppresses cisplatin-induced apoptosis by targeting Smad2 of the transforming growth factor beta signal pathway. [J Virol. 2011 Jan;85\(1\):276-85.](#)
14. Ardakani, A.G. *et al.* (2014) Quantifying the correlation between spatially defined oxygen gradients and cell fate in an engineered three-dimensional culture model. [J R Soc Interface. 11. pii: 20140501.](#)
15. Nakayama, G.R. *et al.* (1997) Assessment of the Alamar Blue assay for cellular growth and viability in vitro. [J Immunol Methods. 204: 205-8.](#)
16. Diril, M.K. *et al.* (2012) Cyclin-dependent kinase 1 (Cdk1) is essential for cell division and suppression of DNA re-replication but not for liver regeneration. [Proc Natl Acad Sci U S A. 109: 3826-31.](#)
17. Warrior, T. *et al.* (2012) Antigen 85C inhibition restricts Mycobacterium tuberculosis growth through disruption of cord factor biosynthesis. [Antimicrob Agents Chemother. 56: 1735-43.](#)
18. Dreidax, D. *et al.* (2013) Low p14ARF expression in neuroblastoma cells is associated with repressed histone mark status, and enforced expression induces growth arrest and apoptosis. [Hum Mol Genet. 22: 1735-45.](#)
19. Wang, H. *et al.* (2014) Enhanced osteoblast responses to poly ether ether ketone surface modified by water plasma immersion ion implantation. [Colloids Surf B Biointerfaces. 117: 89-97.](#)
20. Park, K.H. *et al.* (2014) Expression of polysialylated neural cell adhesion molecules on adult stem cells after neuronal differentiation of inner ear spiral ganglion neurons. [Biochem Biophys Res Commun. pii: S0006-291X\(14\)00889-4.](#)
21. Moreira, A. *et al.* (2015) Adipocyte secreted factors enhance aggressiveness of prostate carcinoma cells. [PLoS One. 10 \(4\): e0123217.](#)
22. Rao, T.D. *et al.* (2015) Expression of the Carboxy-Terminal Portion of MUC16/CA125 Induces Transformation and Tumor Invasion. [PLoS One. 10 \(5\): e0126633.](#)
23. Mabuchi, Y. & Frankel, T.L. (2016) Functions of innate and acquired immune system are reduced in domestic pigeons (*Columba livia domestica*) given a low protein diet [Royal Society Open Science. 3 \(3\): 150408.](#)

24. Santofimia-Castaño Patricia *et al.* (2014) Change in the Characteristics of Ca²⁺ Signaling in Pancreatic Acinar Cells in Culture [The Open Access Journal of Science and Technology. 2: 1-12.](#)
25. Xu, S. *et al.* (2016) MicroRNA-33 promotes the replicative senescence of mouse embryonic fibroblasts by suppressing CDK6 [Biochem Biophys Res Com. Apr 6 \[Epub ahead of print\]](#)
26. Drong, C. *et al.* (2016) Effects of monensin and essential oils on immunological, haematological and biochemical parameters of cows during the transition period. [J Anim Physiol Anim Nutr \(Berl\). Mar 2. \[Epub ahead of print\]](#)
27. van Driel, P.B. *et al.* (2016) EGFR targeted nanobody-photosensitizer conjugates for photodynamic therapy in a pre-clinical model of head and neck cancer. [J Control Release. 229: 93-105.](#)
28. Howe GA *et al.* (2016) Focal Adhesion Kinase Inhibitors in Combination with Erlotinib Demonstrate Enhanced Anti-Tumor Activity in Non-Small Cell Lung Cancer. [PLoS One. 11 \(3\): e0150567.](#)
29. Fernández-Gutiérrez M *et al.* (2016) Stimuli-responsive chitosan/poly (N-isopropylacrylamide) semi-interpenetrating polymer networks: effect of pH and temperature on their rheological and swelling properties. [J Mater Sci Mater Med. 27 \(6\): 109.](#)
30. van Driel, P.B. *et al.* (2016) EGFR targeted nanobody-photosensitizer conjugates for photodynamic therapy in a pre-clinical model of head and neck cancer. [J Control Release. 229: 93-105.](#)
31. Grasys J *et al.* (2016) Content of Soluble Factors and Characteristics of Stromal Vascular Fraction Cells in Lipoaspirates from Different Subcutaneous Adipose Tissue Depots. [Aesthet Surg J. Feb 23. pii: sjw022. \[Epub ahead of print\]](#)
32. Liu, T.T. *et al.* (2016) Effects of processing methods on composition and functionality of volatile components isolated from immature fruits of atemoya. [Food Chem. 202: 176-83.](#)
33. Tuin, S.A. *et al.* (2016) Creating tissues from textiles: scalable nonwoven manufacturing techniques for fabrication of tissue engineering scaffolds. [Biomed Mater. 11 \(1\): 015017.](#)
34. Chauhan, S. *et al.* (2016) Cdk2 catalytic activity is essential for meiotic cell division *in vivo*. [Biochem J. 473 \(18\): 2783-98.](#)
35. Yu, Hui-Chieh. *et al.* (2016) Effects of fibroblast growth factor-2 on cell proliferation of cementoblasts [Journal of Dental Sciences. Nov 5 \[Epub ahead of print\]](#)
36. Bertoldi, S. *et al.* (2015) Exploiting novel sterilization techniques for porous polyurethane scaffolds. [J Mater Sci Mater Med. 26 \(5\): 182.](#)
37. Botero A *et al.* (2016) *In vitro* drug susceptibility of two strains of the wildlife trypanosome, *Trypanosoma copemani*: A comparison with *Trypanosoma cruzi*. [Int J Parasitol Drugs Drug Resist. 7 \(1\): 34-41.](#)
38. Zhang, Y-G, *et al.* (2016) Novel interconnected nanochannel hydroxyapatite ceramic: *in situ* synthesis, microstructure, and permeability [Ceramics International. Dec 23 \[Epub ahead of print\]](#)
39. Bernardini, F.P. *et al.* (2015) Superficial Enhanced Fluid Fat Injection (SEFFI) to Correct Volume Defects and Skin Aging of the Face and Periocular Region. [Aesthet Surg J. 35 \(5\): 504-15.](#)
40. Howe, G.A. *et al.* (2016) Focal Adhesion Kinase Inhibitors in Combination with

- Erlotinib Demonstrate Enhanced Anti-Tumor Activity in Non-Small Cell Lung Cancer. [PLoS One. 11 \(3\): e0150567.](#)
41. Li, G. *et al.* (2017) Antimicrobial susceptibility and MIC distribution of 41 drugs against clinical isolates from China and reference strains of nontuberculous mycobacteria. [Int J Antimicrob Agents. 49 \(3\): 364-374.](#)
42. Deschamps, E. *et al.* (2014) Characterization of indoor dust from Brazil and evaluation of the cytotoxicity in A549 lung cells. [Environ Geochem Health. 36 \(2\): 225-33.](#)
43. Lara, D. *et al.* (2010) Anti-trypanosomatid activity of ceragenins. [J Parasitol. 96 \(3\): 638-42.](#)
44. Lee, Y.W. *et al.* (2017) Effects of Redox Modulation on Cell Proliferation, Viability, and Migration in Cultured Rat and Human Tendon Progenitor Cells. [Oxid Med Cell Longev. 2017: 8785042.](#)
45. DiSpigna, G. *et al.* (2017) Human cardiac multipotent adult stem cells in 3D matrix: new approach of tissue engineering in cardiac regeneration post-infarction. [J Biol Regul Homeost Agents. 31 \(4\): 911-921.](#)
46. Martínez-morcillo, S. *et al.* (2018) The organophosphorus pesticide dimethoate decreases cell viability and induces changes in different biochemical parameters of rat pancreatic stellate cells. [Toxicol In Vitro. 54: 89-97.](#)
47. Jyotsana, N. *et al.* (2019) Lipid nanoparticle-mediated siRNA delivery for safe targeting of human CML *in vivo*. [Ann Hematol. 98 \(8\): 1905-18.](#)
48. Looi, C.Y. *et al.* (2013) Induction of apoptosis in human breast cancer cells via caspase pathway by vernodalin isolated from *Centratherum anthelminticum* (L.) seeds. [PLoS One. 8 \(2\): e56643.](#)
49. Shechter, D. *et al.* (2020) Breast Cancer-Derived Microparticles Reduce Cancer Cell Adhesion, an Effect Augmented by Chemotherapy. [Cells. 9 \(10\) 2269.](#)
50. Jiménez-Holguín, J. *et al.* (2020) Strontium-Modified Scaffolds Based on Mesoporous Bioactive Glasses/Polyvinyl Alcohol Composites for Bone Regeneration. [Materials \(Basel\). 13 \(23\) Dec 03 \[Epub ahead of print\].](#)
51. Perut, F. *et al.* (2020) Citrate Supplementation Restores the Impaired Mineralisation Resulting from the Acidic Microenvironment: An *In Vitro* Study. [Nutrients. 12 \(12\)Dec 09 \[Epub ahead of print\].](#)
52. Huber, L. *et al.* (2020) FGF Expression in HPV16-positive and -negative SCC After Treatment With Small-molecule Tyrosine Kinase Inhibitors and Everolimus. [Anticancer Res. 40 \(10\): 5621-30.](#)
53. Ansari, Z. *et al.* (2020) *In-Situ* Synthesis and Characterization of Chitosan/Hydroxyapatite Nanocomposite Coatings to Improve the Bioactive Properties of Ti6Al4V Substrates. [Materials \(Basel\). 13 \(17\)Aug 26 \[Epub ahead of print\].](#)
54. Yang, P.M. *et al.* (2020) Carbon monoxide-releasing molecules protect against blue light exposure and inflammation in retinal pigment epithelial cells. [Int J Mol Med. 46 \(3\): 1096-106.](#)
55. Calejo, I. *et al.* (2019) A Textile Platform Using Continuous Aligned and Textured Composite Microfibers to Engineer Tendon-to-Bone Interface Gradient Scaffolds. [Adv Healthc Mater. 8 \(15\): e1900200.](#)
56. Huang, C.L. *et al.* (2020) Antimicrobial Activity of Electrospun Polyvinyl Alcohol Nanofibers Filled with Poly[2-(tert-butylaminoethyl) Methacrylate]-Grafted Graphene Oxide Nanosheets. [Polymers \(Basel\). 12 \(7\)Jun 28 \[Epub ahead of print\].](#)
57. Wu, L. *et al.* (2020) Human airway-like multilayered tissue on 3D-TIPS printed

thermoreponsive elastomer/collagen hybrid scaffolds. [Acta Biomater. 113: 177-95.](#)

58. Cometa, S. *et al.* (2021) A 3D Printed Composite Scaffold Loaded with Clodronate to Regenerate Osteoporotic Bone: *In Vitro* Characterization. [Polymers \(Basel\). 13\(1\):150.](#)

59. Badwelan, M. *et al.* (2020) Poly(δ -valerolactone)/Poly(ethylene-co-vinylalcohol)/ β -Tricalcium Phosphate Composite as Scaffolds: Preparation, Properties, and *In Vitro* Amoxicillin Release. [Polymers \(Basel\). 13\(1\):46.](#)

60. Alhuthali, H.M. *et al.* (2020) The natural alkaloid Jerantinine B has activity in acute myeloid leukemia cells through a mechanism involving c-Jun. [BMC Cancer. 20 \(1\): 629.](#)

61. Ho, C.L. *et al.* (2020) Eucalyptus essential oils inhibit the lipopolysaccharide-induced inflammatory response in RAW264.7 macrophages through reducing MAPK and NF- κ B pathways. [BMC Complement Med Ther. 20 \(1\): 200.](#)

62. Fatima, S. *et al.* (2021) Selenium Nanoparticles by Moderating Oxidative Stress Promote Differentiation of Mesenchymal Stem Cells to Osteoblasts. [Int J Nanomedicine. 16: 331-43.](#)

63. Mojena-Medina, D. *et al.* (2020) Design, Implementation, and Validation of a Piezoelectric Device to Study the Effects of Dynamic Mechanical Stimulation on Cell Proliferation, Migration and Morphology. [Sensors \(Basel\). 20 \(7\): 2155.](#)

64. Gonzalez, A. *et al.* (2020) Melatonin modulates red-ox state and decreases viability of rat pancreatic stellate cells. [Sci Rep. 10 \(1\): 6352.](#)

65. Juillerat-Jeanneret, L. *et al.* (2008) Heterogeneity of human glioblastoma: glutathione-S-transferase and methylguanine-methyltransferase. [Cancer Invest. 26 \(6\): 597-609.](#)

66. Scialla, S. *et al.* (2019) Bioactive chitosan-based scaffolds with improved properties induced by dextran-grafted nano-maghemite and l-arginine amino acid. [J Biomed Mater Res A. 107 \(6\): 1244-52.](#)

Further Reading	1. Rampersad SN (2012) Multiple applications of Alamar Blue as an indicator of metabolic function and cellular health in cell viability bioassays. Sensors (Basel). 12 (9): 12347-60.
Storage	Store at +4°C. DO NOT FREEZE. This product should be stored undiluted. This product is photosensitive and should be protected from light.
Guarantee	Guaranteed until date of expiry. Please see product label.
Acknowledgements	Manufactured for Bio-Rad by Trek Diagnostic System. U.S. patent 5,501,959.
Health And Safety Information	Material Safety Datasheet documentation #10289 available at: https://www.bio-rad-antibodies.com/SDS/BUF012B 10289
Regulatory	For research purposes only

Related Products

Recommended Useful Reagents

[alamarBlue® \(BUF012A\)](#)

To find a batch/lot specific datasheet for this product, please use our online search tool at: [bio-rad-antibodies.com/datasheets](https://www.bio-rad-antibodies.com/datasheets)

North & South Tel: +1 800 265 7376

America Fax: +1 919 878 3751

Email: antibody_sales_us@bio-rad.com

Worldwide

Tel: +44 (0)1865 852 700

Fax: +44 (0)1865 852 739

Email: antibody_sales_uk@bio-rad.com

'M360660:200108'

Europe

Tel: +49 (0) 89 8090 95 21

Fax: +49 (0) 89 8090 95 50

Email: antibody_sales_de@bio-rad.com

Printed on 21 Jun 2024

© 2024 Bio-Rad Laboratories Inc | [Legal](#) | [Imprint](#)