

Sutherland Maciver publications

- 82). Sutherland, L., Ruhe, M., Gattegno-Ho, D., Mann, K., Greaves J., Stasiulewicz, M., Meek, S., Lu, Z., Waterfall, M., Taylor, R., Tsakiridis, A., **Maciver, S.K.**, Joshi, A., Clinton, M., Chamberlain, L.H., Smith, A. Burdon, T. (2018). LIF-dependent survival of embryonic stem cells is regulated by a novel palmitoylated Gab1 signalling protein. *J. Cell Sci.* 131: jcs222257 doi: 10.1242/jcs.222257
- 81). Kang, A.-Y., Park, A.-Y., Shin, H.-J., Khan, N.A., **Maciver, S.K.**, Jung, S.-Y. (2018) Production of a monoclonal antibody against a mannose-binding protein of *Acanthamoeba culbertsoni* and its localization. *Exp. Parasitol.* 192, 19-24.
- 80). Baroni, L., Pereira, L.M., **Maciver, S.K.**, Yatsuda, A.P. (2018) Functional characterisation of the actin-depolymerising factor from the apicomplexan *Neospora caninum* (NcADF). *Molecular & Biochemical Parasitology* 224, 26-36.
- 79). De Obeso Fernandez Del Valle, A., **Maciver, S.K.**, (2017) *Allovaahlkampfia minuta* nov. sp., (Heterolobosea, Excavata) a new soil amoeba at the boundary of the acrasid cellular slime moulds. *Acta protozool.* 56(3), 183-191
- 78). De Obeso Fernandez Del Valle, A. Lorenzo-Morales, J. & **Maciver, S.K.** (2017) *Leptomyxa valladaresi* n. sp. (Amoebozoa, Tubulinea), from Mount Teide, Tenerife, Spain. *Exp. Parasitol.* 183, 85-91
- 77). **Maciver, S.K.**, De Obeso Fernandez Del Valle, A., & Z. *Koutsogiannis* (2017) *Vannella pentlandii* n. sp., (Amoebozoa, Discosea, Vannellida) a small, cyst-forming soil amoeba. *Exp. Parasitol.* 183, 109-116
- 76). Nozawa, R.-S., Boteva, L., Soares, D., Naughton, C., Dun, A.R., Buckle, A., Ramsahoye, B., Bruton, P., Saleeb, R.S., Arnedo-Munoz, M., Hill, B., Duncan, R.R., **Maciver, S.K.** & Gilbert, N. (2017) SAF-A regulates interphase chromosome structure through oligomerisation with chromatin-associated RNAs. *Cell* 169(7), 1214-1227
- 75). Martín-Navarro, C., López-Arencibia, A., Sifaoui, I., Reyes-Batlle M., Fouque, E., Usuna, A., Valladares, B., Piñero, J.E., Héchard, Y., **Maciver, S.K.**, & Lorenzo-Morales, J. (2017) Amoebicidal activity of caffeine and maslinic acid by the induction of Programmed Cell Death in *Acanthamoeba*. *Antimicrobial Agents and Chemotherapy*. 61(6), e02660-16.
- 74). López-Arencibia, A., Martín-Navarro, C., Sifaoui, I., Reyes-Batlle M., Wagner, C., Lorenzo-Morales J., **Maciver, S.K.** & Piñero, J.E. (2017) Perifosine mechanisms of action in *Leishmania* spp. *Antimicrobial Agents and Chemotherapy*. 61(4), e02127-16.
- 73). Wagner, C., María, Vethencourt Ysea, M.A. Galindo, M.V., Guzmán de Rondón, C., Nessi, A.J., Reyes-Batlle, M., López-Arencibia, A. Martín-Navarro, C.M., Sifaoui, I., Pérez de Galindo, M.V., Martínez-Carretero, E., Valladares, B., **Maciver, S.K.**, Piñero, J.E., Lorenzo-Morales, J. (2017). Isolation of *Naegleria fowleri* from a domestic water tank associated with a fatal encephalitis in a 4 month-old Venezuelan child. *Tropical Biomedicine* 34(2), 332-337.
- 72). **Maciver, S.K.**, Evans, J., Borg, J.A., Ramos Espà, A.A. & Schembri, P.J. (2017). Status of the “Mangrove tunicate” *Ecteinascidia turbinata* (Asciidae: Perophoridae) in the Mediterranean. *J. Mar.Biol.Ass. UK* 97(2), 369-376.
- 71). **Maciver, S.K.** (2016) Asexual amoebae escape Muller’s ratchet through polyploidy. *Trends in Parasitology* 32(11), 855-862.
- 70). Tochhawng, L., Shuo, D., Pugalenthhi, G., Kumar, A.P., Lim, K.H., Yang, H., Hooi, S.C., Goh, Y.C., **Maciver, S.K.**, Pervaiz, S., & Yap, C.T. (2016). Gelsolin-Cu/ZnSOD interaction alters intracellular reactive oxygen species levels to promote cancer cell invasion *Oncotarget* 7(33), 52832-52848.
- 69). Huang, B., Deng, S., Loo, S.Y., Datta, A., Yap, Y.L., Yan, B., Ooi, C.H., Dinh, T.D., Zhuo, J., Tochhawng, L., Gopinadhan, S., Jegadeesan, T., Tan, P., Salto-Tellez, M., Peng, W., Yong, W.P., Soong, R., Yeoh, K.G., Goh, Y.C., Lobie, P.E., Yang, H., Kumar, A.P., **Maciver S.K.**, So, J.B.K., & Yap, C.T. (2016). Gelsolin-mediated activation of PI3K/Akt pathway is crucial for hepatocyte growth factor-induced cell scattering in gastric carcinoma. *Oncotarget* 7(18), 25391-25407.
- 68). Martín-Navarro, C., López-Arencibia, Sifaoui, I., A., Reyes-Batlle, M., Valladares, B., Martinez-Carretero, E., Piñero, J., **Maciver, S.K.**, and M., Lorenzo-Morales, J. (2015). Statins and voriconazole induce programmed cell death in *Acanthamoeba castellanii*. *Antimicrobial Agents and Chemotherapy*. 59(5), 2817-2824.

- 67). Valladares, M., Reyes-Batlle, M., Mora-Peces, I., Martín-Navarro, C. M., López-Arencibia, A., Martínez-Carretero, E., **Maciver, S. K.**, Piñero, J. E., Valladares, B., and Lorenzo-Morales, J. (2014) A multisystemic *Acanthamoeba* infection in a dog in Tenerife, Canary Islands, Spain. *Veterinary Parasitology* 205(3-4), 707-711.
- 66). Martín-Navarro, C., López-Arencibia, Sifaoui, I., A., Reyes-Batlle, Cabello-Vilchez, A.M., **Maciver, S.K.** M., Valladares, B., Piñero, J., Lorenzo-Morales, J. (2014). Presto blue and Alamar blue are equally useful as agents to determine the viability of *Acanthamoeba* trophozoites. *Expt. Parasitology* 145, 69-72.
- 65). Cabello-Vilchez, A. M., Reyes-Batlle, M., Montalbán- Sandoval, E., Martín-Navarro, C. M., López-Arencibia, A., Elias-Letts, R., Guerra, H., Gotuzzo, E., Piñero, J. E., **Maciver, S. K.**, Martínez-Carretero, E., Valladares, B., and Lorenzo-Morales, J. (2014) The isolation of *Balamuthia mandrillaris* from environmental sources from Peru. *Parasitology Research* 113, 2509-2513.
- 64). Martín-Navarro, C., Lorenzo-Morales, J. López-Arencibia, A., Reyes-Batlle, M., Piñero, J., Valladares, B., & **Maciver, S.K.** (2014) Evaluation of *Acanthamoeba* myosin-IC as a potential therapeutic target. *Antimicrobial Agents and Chemotherapy* 58(4) 2150-2155.
- 63). **Maciver, S.K.**, Asif, M., Simmen, M.W. & Lorenzo-Morales, J. (2013). A systematic analysis of *Acanthamoeba* genotype frequency correlated with source and pathogenicity: T4 is confirmed as a pathogen-rich genotype. *Eur.J.Protistol.* 49(2), 217-221.
- 62). Martín-Navarro, C.M., Lorenzo-Morales, J., Machin, R.P., López-Arencibia, García-Castellano, A.M., de Fuentes, I., Loftus, B., **Maciver, S.K.**, Valladares, B. & Piñero J.E. (2013) Inhibition of HMG-CoA reductase and the application of statins as a novel effective therapeutic approach against *Acanthamoeba* infections. *Antimicrobial Agents and Chemotherapy* 57(1) 375-381.
- 61). Zhuo, J., Tan, E.H.Benedict Yan, B., Tochhawng, L., Jayapal, M., Koh, S., Tay, H.K., **Maciver, S.K.**, Hooi, S.C., Salto-Tellez, M., Kumar, A.P., Goh, Y.C., Lim, Y.C. & Yap, C.T (2012) Gelsolin induces colorectal tumor cell invasion via modulation of the urokinase-type plasminogen activator cascade. *PloS ONE* 7(8): e43594. doi:10.1371/journal.pone.0043594
- 60). Prescott, T., Kiaprannis, R. & **Maciver, S.K.** (2012) In-the-field antibacterial testing of medicinal plants from the Bulu and Kaulong people groups of New Britain. *Journal of Ethnopharmacology* 139(2) 497-503.
- 59). Lorenzo-Morales, J., Morcillo-Laiz, R., Carrmen M.-N., López-Vélez, R., López-Arencibia, A., Arnalich-Montiel, A.F., **Maciver, S.K.**, Basilio Valladares, B. & Martínez-Carretero, E. (2011) *Acanthamoeba* infection due to T11 genotype as a cause of severe keratitis in a soft contact lens wearer in Spain. *Contact Lens & Anterior Eye*. 34(2) 83-86.
- 58). **Maciver, S.K.** (2010) Problem seaweeds of Scotland. *Botanical Society of Scotland News* 95 (September).
- 57). Lorenzo-Morales, J., Marciano-Cabral, F., Lindo, J.F., Visvesvara, G.S., **Maciver, S.K.** (2010) Pathogenicity of amoeba. *Experimental Parasitology*. 126, 2-3.
- 56). Ferjani, I., Fattoum, A., Bettache, N., Seantier, B., Milhiet, P.E., Manai, M., Yves Benyamin, Roustan, C., & **Maciver, S.K.** (2010). The gelsolin:calponin complex nucleates actin filaments with distinct morphologies. *Biochemical and Biophysical Research Communications*. 392, 118-123.
- 55). Ferjani,I.,Fattoum, A., Manai, M., Benyamin, Y., Roustan, C., **Maciver , S.K.** (2010) Two distinct regions of calponin share common binding sites on actin resulting in different modes of calponin : actin interaction. *Biochimica et Biophysica Acta - Proteins and Proteomics* 1804, 1760-1767
- 54). Lorenzo-Morales, J., Martín-Navarro C.M., López-Arencibia, A., **Maciver, S.K.**, Valladares, B., Martínez-Carretero, E. (2010) The therapeutic potential of a combination of two gene-specific siRNAs against clinical strains of *Acanthamoeba* and its relevance to neglected tropical diseases. *Antimicrobial Agents & Chemotherapy* 54(12), 5151-5155.
- 53). Prescott, T., Bramham, J., Zompro, O. **Maciver, S.K.** (2010) Actinidine and glucose from the defensive secretion of the stick insect *Megacrania nigrosulfurea*. *Biochemical Systematics and Ecology* 37, 759-760.

- 52). Bonet, C., **Maciver, S.K.** Mozo-Villarias, A., (2010) The regulatory action of α -actinin on actin filaments is enhanced by cofilin. *Eur. Biophys. J.* 39, 1143-1153.
- 51). Niyyati M, Lorenzo-Morales J, Rezaeian M, Martin-Navarro CM, Haghi AM, **Maciver SK**, Valladares B. (2009) Isolation of *Balamuthia mandrillaris* from urban dust, free of known infectious involvement. *Parasitology Research* 106(1), 279-281.
- 50). Lorenzo-Morales, J., Coronado-Álvarez, N., Martínez-Carretero, E., **Maciver, S.K.**, Valladares, B. (2007). Detection of four adenovirus serotypes within water isolated strains of *Acanthamoeba* in the Canary islands, Spain. *Am.J.Trop.Med.Hyg.* 77(4), 753-796
- 49). Deeks, M.J., Rodrigues, C., Dimmock, S., Ketelaar, T., **Maciver, S.K.**, Malho, R., Hussey, P.J. (2007). *Arabidopsis CAP1*, a key regulator of actin organisation and development. *J.Cell.Sci.* 120, 2609-2618.
- 48). Ferjani, C.I., **Maciver, S.K.**, Fattoum, A., Rebière B., Benyamin, Y. and Roustan, C., (2007) Two distinct sites of interaction form the calponin : gelsolin complex and two calcium switches its activity. *Biochimica et Biophysica Acta - Proteins and Proteomics* 1774, 952-958.
- 47). Roustan, C., Ferjani, C.I., **Maciver, S.K.**, Fattoum, A., Rebière B. and Benyamin, Y. (2007) Calcium-induced conformational changes in the amino-terminal half of gelsolin. *FEBS letters* 581, 681-686.
- 46). Agrawal, P.B., Greenleaf, R.S., Tomczak, K.K., Lehtokari, V.-L., Wallgren-Pettersson, C., Wallefeld, W., Laing, N.G., Darras, B.T., **Maciver, S.K.**, Dormitzer, P.R. and Beggs, A.H. (2007) Nemaline myopathy with minicores caused by mutation of the *CFL2* gene encoding the skeletal muscle actin-binding protein, cofilin-2. *American Journal of Human Genetics*. 80 (1), 162-167.
- 45). **Maciver, S.K.** (2007) The threat from *Balamuthia mandrillaris*. *J. Med. Microbiol.* 56, 1-3.
- 44). Prescott, T.A.K., Sadler, I.H., Kiapranis, R., **Maciver, S.K.** (2007) Lunacridine from *Lunasia amara* is a DNA intercalating topoisomerase II inhibitor. *J. Ethnopharm* 109(2):289-94.
- 43). Ferjani, I., Fattoum, A., **Maciver, S.K.**, Manai. M., Benyamin, Y., Roustan, C. (2006). Calponin binds G-actin and F-actin with similar affinity. *FEBS letters* 580, 4801-4806.
- 42). Ferjani I, Fattoum A, **Maciver SK**, Bénistant C, Chahinian A, Manai M, Benyamin Y, Roustan C (2006) A direct interaction with calponin inhibits the actin nucleating activity of gelsolin. *Biochemical J.* 396 (3), 461-468.
- 41). Lorenzo-Morales J, **Maciver SK** (2006) Long-term, low maintenance storage of *Acanthamoeba* strains. *Parasitology Research* 99(6), 743-745.
- 40). Roustan C, Lagarrigue E, Ternent D, **Maciver SK**, Fattoum A, Benyamin Y (2006) Evidence for anti-parallel actin dimer formation by calcium activated gelsolin and its role in the nucleation of actin assembly. *Calcium Binding Proteins* 1(1): 45-50.
- 39). Mere J, Chahinian A, **Maciver S K**, Fattoum A, Bettache N, Benyamin Y, Roustan C (2005) Gelsolin binds to polyphosphoinositide-free lipid vesicles and simultaneously to actin microfilaments. *Biochem J* 386: 47-56
- 38). Yap CT, Simpson TI, Pratt T, Price DJ, **Maciver SK** (2005) The motility of glioblastoma tumour cells is modulated by intracellular cofilin expression in a concentration-dependent manner. *Cell Motil Cytoskeleton* 60: 153-165
- 37). Lagarrigue, E., Ternent, D., **Maciver, S.K.**, Fattoum, A., Benyamin, Y. & Roustan, C. (2003a). The activation of gelsolin by low pH. The calcium latch is sensitive to calcium but not pH. *Eur.J.Biochem.* 270, 4105-4112.
- 36). Lagarrigue, E., **Maciver, S.K.**, Fattoum, A., Benyamin, Y. & Roustan, C. (2003b) Co-operation of domain-binding and calcium-binding sites in the activation of gelsolin. *Eur.J.Biochem.* 270, 2236-2243

- 35). Blondin, L., Sapountzi, V., **Maciver, S.K.**, Lagarrigue, E., Benyamin, Y.A (2002). Structural Basis for the pH-Dependence of Cofilin : F-Actin Interactions. *Eur.J.Biochem.* 269, 4194-4201.
- 34). **Maciver, S.K.** & Hussey, P.J. (2002). The ADF/cofilin family: actin-remodeling proteins. *Genome Biology* 3(5), 3007.1 - 3007.12.
- 33). Blondin, L., Sapountzi, V., **Maciver, S.K.**, Renoult, C., Benyamin, Y. and Roustan, C. (2001). The second ADF/cofilin actin-binding site exists in F-actin, the cofilin-G-actin complex, but not in G-actin. *Eur.J.Biochem.* 268, 6426-6434.
- 32). Renoult, C., Blondin, L., Fattoum, A., Ternent, D., **Maciver, S.K.**, Raynaud, F., Benyamin, Y. and Roustan, C. (2001). Binding of gelsolin domain 2 to actin: An interface distinct from that of gelsolin domain 1 and from ADF/cofilin. *Eur.J.Biochem.* 268, 6165-6175.
- 31). Gungabissoon, R.A., Khan, S., Hussey, P.J. & **Maciver, S.K.** (2001). The interaction of maize elongation factor1 α (ZmEF-1 α) with F-actin and interplay with the maize actin severing protein, ZmADF3. *Cell Motility & Cytoskeleton*. 49(2) 104-111.
- 30). **Maciver, S.K.** (2001) "Polymerization dynamics of cytoskeletal filaments" Encyclopedia of Life Sciences. Nature Publishing Group
- 29). Smertenko, A.P., Allwood, E.G., Jiang, C.-J., **Maciver, S.K.**, Weeds, A.G. and Hussey, P.J. (2001). "Interaction of pollen-specific actin-depolymerizing factor with actin". *Plant J.* 25(2), 213-229.
- 28). **Maciver, S.K.** (2001). Regulation of Titin, the cell's Bungee cord. In The ELSO Gazette: e-magazine of the European Life Scientist Organization (<http://www.the-elso-gazette.org/>) Issue 3 (January, 2001).
- 27). **Maciver, S.K.**, Ternent, D., and McLaughlin, P.J. (2000). Domain 2 of gelsolin binds directly to tropomyosin. *FEBS letters*. 473, 71-75.
- 26). Bonet, C., Ternent, D., **Maciver, S.K.** & Mozo-Villarias, A. (2000). Rapid formation and high diffusibility of actin-cofilin cofilaments at low pH. *Eur.J. Biochem.* 267, 3378-3384.
- 25). Renoult, C., Ternent, D., **Maciver, S.K.** , Fattoum, A., Astier, C., Benyamin, Y., and Roustan, C. (1999). The identification of a second cofilin binding site on actin suggests a novel, intercalated arrangement of F-actin binding. *J. Biol. Chem.* 274 28893-28899.
- 24). **Maciver, S.K.** (1999) Polymerization dynamics. *Encyclopaedia of Life Sciences* Macmillan Reference Ltd, Stockton Press.
- 23). **Maciver, S.K.**, Pope, B.J., Whytock, S. and Weeds, A.G. (1998) The effect of two actin depolymerizing factors (ADF/cofilins) on actin filament turnover: pH sensitivity of F-actin binding by human ADF, but not of *Acanthamoeba* actophorin. *Eur.J.Biochem.* 256 388-397.
- 22). Gungabissoon, R.A., Jiang, C.-J. Drøbak, B.K., **Maciver, S.K.** and Hussey, P.J. (1998) Interaction of maize actin-depolymerising factor with actin and phosphoinositides and its inhibition of plant phospholipase C. *The Plant Journal* 16 689-696.
- 21). **Maciver, S.K.** (1998) How ADF/cofilin depolymerizes actin filaments. *Curr.Opin.Cell Biol.* 19; 140-144.
- 20). Lopez, I., Anthony, R.G., **Maciver, S. K.** , Jiang, C.-J., Khan,S., Weeds, A.G. and Hussey, P.J. (1996). Pollen specific expression of maize genes encoding actin depolymerizing factor-like proteins. *Proc.Nat.Acad.Sci USA* . 93 7415-7421.
- 19). **Maciver, S.K.**, and Weeds, A.G. (1996). Cell Motility. in " *Principles in Medical Biology*". Vol 4. JAI press 77-106.
- 18). **Maciver, S.K.** (1996) Myosin II function in non-muscle cells *BioEssays* 18, 179-182.

- 17). Winder, S.J., Hemmings, L.H., **Maciver, S.K.**, Bolton, S.J., Tinsley, J.M., Davies, K.E., Critchley, D.R. and Kendrick-Jones, J. (1995). Utrophin actin binding domain: Analysis of actin binding and cellular targeting. *J.Cell Sci.* 108, 63-71.
- 16). Pope, B., **Maciver, S.K.**, and Weeds, A.G. (1995). Localization of the calcium sensitive actin monomer binding site in gelsolin to segment 4 and identification of calcium-binding sites. *Biochemistry*. 34, 1583-1588.
- 15). Murgia, I., **Maciver, S.K.**, Morandini, P. (1995). An actin-related protein from *Dictyostelium discoideum* is developmentally regulated: Cloning and localization to mitochondria. *FEBS letters*, 360, 235-241.
- 14). **Maciver, S.K.** and Harrington, C.R. (1995). Two actin binding proteins, actin depolymerizing factor and cofilin are associated with Hirano bodies. *NeuroReport* 6, 1985-1988.
- 13). **Maciver, S.K.** (1995). Microfilament organization and actin binding proteins. in "Treatise on the Cytoskeleton". "Structure and Assembly" Vol 1. Eds Hesketh, J.E. and Pryme, I.F. publ. JAI press 1-45.
- 12). Winder, S.J., Hemmings, L.H., Bolton, S.J., **Maciver, S.K.**, Tinsley, J.M., Davies, K.E., Critchley, D.R. & Kendrick-Jones, J. (1995). Calmodulin regulation of utrophin actin binding. *Biochem Soc. Trans.* 23, 397S.
- 11). **Maciver, S.K.**, & Weeds, A.G. (1994). Actophorin preferentially binds monomeric ADP-actin over ATP-bound actin: consequences for cell locomotion. *FEBS letters* 347, 251-256.
- 10). **Maciver, S.K.** (1994). Microfilaments. in "The Encyclopaedia of Molecular Biology", Ed Kendrew, J. publ. Blackwells Science.
- 9). **Maciver, S.K.** (1994). Actin Binding Proteins. in "The Encyclopaedia of Molecular Biology", Ed Kendrew, J.publ. Blackwells Science.
- 8). Quirk, S., **Maciver, S.K.**, , Ampe, C., Doberstein, S.K., Kaiser, D.A., Van Damme, J. , Vandekerckhove, J.S. & Pollard, T.D. (1993) Primary structure of and studies on *Acanthamoeba* actophorin. *Biochemistry* 32, 8525-8533.
- 7). Hawkins, M., Pope, B., **Maciver, S.K.** & Weeds, A.G. (1993). Human Actin Depolymerizing Factor mediates a pH sensitive destruction of actin filaments. *Biochemistry* 32, 9985-9993.
- 6). Weeds, A.G. & **Maciver, S.K.** (1993). F-actin capping protein. *Current Opinion in Cell Biology*. 5(1), 63-70.
- 5). **Maciver, S.K.**, Zot, H.G, & Pollard, T.D. (1991).Characterization of Actin Filament Severing by Actophorin from *Acanthamoeba castellanii*. *J.Cell Biol.* 115; 1611-1620.
- 4). **Maciver, S.K.**, Wachsstock, D., Schwarz, W.H, & Pollard, T.D. (1991). The Actin Filament Severing Protein Actophorin Promotes the Formation of Rigid Bundles of Actin Filaments Crosslinked with α -actinin. *J.Cell Biol.* 115;1621-1628.
- 3). Pollard, T.D., K.A. Magnus, S.K. Doberstein, P. Goldschmidt-Clermont, D.A. Kaiser, L.M. Machesky, **S.K. Maciver**, D.L. Rimm, & D. Wachsstock. (1989). Structure-function studies of the actin filament system of *Acanthamoeba*. In: "Springer series in Biophysics" (U. Aebi, J. Engel, eds), Vol. 3 "Cytoskeletal and Extracellular Proteins", 2nd Intern. Symp. European Biophys. Soc., Gwatt, Switzerland, pp. 271-279, London (1989).
- 2). Magnus, K. A., **Maciver, S. K.** , & Pollard, T.D. (1988). Crystallization of actophorin, an actin filament severing protein from *Acanthamoeba* *J.Biol.Chem.* 263; 18143-18144.
- 1). King, C. A. & **Maciver, S. K.** (1987). Spatial organization of microfilaments in amoeboid locomotion. in "Spatial Organization in Eukaryotic Microbes." eds. Paule, R. K. & Trink, A. P. G. *Soc. Gen. MicroBiol.* 23, 101-118.