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| **CHARACTERISTICS** |
| Morphology | Spriochete, spiral-shaped bacteria. |
| Disease | Causes Lyme disease, Lyme borreliosis, relapsing fever, Erythema migrans (EM) with polyarthritis, Lyme arthritis, Tickborne meningopolyneuritis. |
| Zoonosis | Yes. |

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| **HEALTH HAZARDS** |
| Host Range | Humans, equine, domestic fowl, domestic companion animals, deer, wild rodents. |
| Modes of Transmission | Exposure to an infected tick.  |
| Signs and Symptoms | Distinctive skin lesion (EM, a red macule or papule that expands in an annular manner), systemic symptoms, polyarthritis, and neurologic and cardiac involvement; malaise, fatigue, fever, headache, stiff neck, mylagia, migratory arthralgias or lympadenopathy lasting several weeks and may precede lesions; neurological and cardiac abnormalities weeks to months after onset of EM; chronic arthritis may develop. |
| Infectious Dose | Unknown. |
| Incubation Period | 3-32 days after tick exposure. |

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| **MEDICAL PRECAUTIONS/TREATMENT** |
| Prophylaxis | Not generally warranted for a tick bite alone. |
| Vaccines | Recombinant outer-surface protein A vaccine (LYMErixT). |
| Treatment | Treatment of EM stage with doxycycline for adults and amoxicillin for children may prevent or lessen the severity of the major late cardiac, neurologic or arthritic complications. |
| Surveillance | Monitor for appearance of typical lesions; serological tests (IFA, ELISA). |
| MSU Requirements | Report any exposures. |

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| **LABORATORY HAZARDS** |
| Laboratory Acquired Infections (LAIs)  | None have been reported. |
| Sources | Clinical specimens - blood, cerebrospinal fluid, urine, skin scrapings, retinal and synovial specimens; naturally or experimentally infected mammals, their ectoparasites and their infected tissues. Cultures, frozen stocks, other samples described in IBC protocol. |

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| **RISK GROUP & CONTAINMENT REQUIREMENTS** |
| Risk Group 2 | Agents that are associated with human disease which is rarely serious and for which preventive or therapeutic interventions are often available. |
| BSL2 | For all procedures involving suspected or known infectious specimen or cultures. |
| ABSL2 | For all procedures utilizing infected animals. |

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| **VIABILITY** |
| Disinfection | 0.5% sodium hypochlorite (1:10 bleach:water), 70% ethanol  |
| Inactivation | moist heat (15 minutes at 121oC) and dry heat (1 hour at 160-170oC). |
| Survival Outside Host | Unknown. |

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| **SUPPLEMENTAL REFERENCES** |
| BMBL | <https://www.cdc.gov/labs/BMBL.html>  |
| NIH Guidelines | <https://osp.od.nih.gov/wp-content/uploads/NIH_Guidelines.pdf>  |
| Canada PSDS | <https://www.canada.ca/en/public-health/services/laboratory-biosafety-biosecurity/pathogen-safety-data-sheets-risk-assessment/borrelia-burgdorferi-material-safety-data-sheets-msds.html> |

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| **SPILL PROCEDURES** |
| Small | Notify others working in the lab. Remove PPE and don new PPE. Cover area of the spill with absorbent material and add fresh 1:10 bleach:water. Allow 20 minutes (or as directed) of contact time. After 20 minutes, cleanup and dispose of materials. |
| Large | * Immediately notify all personnel in the lab and clear all personnel from the area. Remove any contaminated PPE/clothing and leave the lab.
* Secure the area by locking doors, posting signage and guarding the area to keep people out of the space.

For assistance, contact MSU's Biosafety Officer (406-994-6733) or Safety and Risk Management (406-994-2711). |

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| **EXPOSURE PROCEDURES** |
| Mucous membrane | Flush eyes, mouth, or nose for 5 minutes at eyewash station. |
| Other Exposures | Wash area with soap and water for 5 minutes. |
| Reporting | Immediately report incident to supervisor, complete a [First Report of Injury](https://firstreportinjury.mus.edu/) form, and submit to Safety and Risk Management. |
| Medical Follow-up | **During business hours:**Bridger Occupational Health 3400 Laramie Drive Weekdays 8am -6pm. Weekends 9am-5pm406-577-7674**After business hours:**Bozeman Deaconess Hospital Emergency Room915 Highland Blvd |

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| **PERSONAL PROTECTIVE EQUIPMENT (PPE)** |
| Minimum PPE Requirements | Lab coat, disposable gloves, safety glasses, closed toed shoes, long pants |
| Additional Precautions | Additional PPE may be required depending on lab specific SOPs and IBC Protocol. |