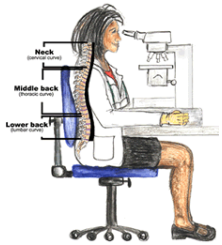
Ergonomics in Laboratories

Task	Risk Factors	Preventative Measures	Proper Equipment
Pipetting 	➢ Repetitive motion – hands, forearm and thumb, fingers ➢ Pinch grip – handling pipette tips, opening vials ➢ Bending and twisting of wrist ➢ "Winged" elbows – elbows at elevated position away from body	➢ Alternate continuous pipetting with other tasks –Take rest breaks every 20 minutes ➢ Use minimal force when applying pipette tips ➢ Work with head, shoulders and wrist in neutral position ➢ Reduce shoulder strain – avoid "winged elbows"	➢ Perform work at appropriate height ➢ Clean pipettors on a regular basis ➢ Use short pipettes and shorter waste containers ➢ Use electronic or ergonomically friendly pipettes ➢ Use adjustable stools or chairs and anti-fatigue mats is standing for extended periods of time
Work within a biological cabinet 	➢ Repetitive motion – hands, wrists and forearms ➢ Contact pressure on forearms, wrists, knees and legs ➢ Awkward and static posture – neck, torso, legs, arms and wrists ➢ Over reaching or extending	➢ Place research materials as close as possible – consider a rotating base ➢ Assume proper posture when sitting or standing ➢ Avoid contact pressure – apply foam padding to front sharp edge of cabinet ➢ Take short but frequent breaks	➢ Ensure proper knee and leg space – possibly raise cabinet ➢ Reduce eye strain by keeping viewing window clean ➢ Make sure lighting is working properly ➢ Use adjustable chairs that provide adequate support
Work with microscope 	➢ Repetition motion of tasks ➢ Awkward and static posture of the neck, head and lower back ➢ "Winged" elbows ➢ Pinch grip – when adjusting binocular eyepiece ➢ Wrist and palm contact pressure in carpal tunnel area ➢ Eye strain and fatigue	➢ Prevent repetition, take small breaks or perform other tasks that require less repetition, rest your eyes, neck and shoulders ➢ Do not work with "winged" elbows, work with wrists in neutral posture ➢ Position microscope as close as possible to ensure upright head position ➢ Avoid forearm and risk contact pressure – pad sharp edges or wrist and forearms ➢ Adjust eyepiece height to allow head and neck to remain neutral	➢ Ensure proper knee and leg space ➢ Use adjustable chairs or stools that provide adequate support consider those with built in foot and forearm rests ➢ Use video display terminal when appropriate to view samples ➢ Ensure microscopes remain clean and lighting is of proper intensity ➢ Use or purchase an extended eye tube or variable height adapter
Working with microtomes 	➢ Repetitive motion	➢ Place microtome on appropriate workbench ➢ Ensure sharp edges are not an issue ➢ Protect wrist and forearms from contact pressure ➢ Use less force when turning hand wheel ➢ Take frequent breaks - every twenty minutes ➢ Replace manual rotary microtome with automatic	➢ Ensure proper knee and leg space ➢ Use adjustable chairs or stools that provide adequate support consider those with built in foot and forearm rest
Micro-manipulation techniques 	➢ Repetitive motion ➢ Pinch grip issues	➢ Use vials with fewer threads ➢ Use small pieces of foam (similar to those on pens and pencils) to prevent soreness in fingertips ➢ Share workload between right and left hand ➢ Use forceps between 1st and 2nd digit instead of using thumb ➢ Take frequent breaks - every twenty minutes	➢ Know how to properly use the equipment ➢ Use the proper equipment for the task
Manipulating centrifuge rotors	➢ Over exertion	➢ Use a second person to assist with the lift	➢ Use a cart to transport rotors

Prepared by Faculty of Health Sciences Safety Office, August 2006 (cg)
For more information see: http://www.dehs.umn.edu/ergo/lab/
or http://dohs.ors.od.nih.gov/lab1.html