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|  | **program Information** | | |
| **NO.** | |  | |
| **Program Type** | | Degree Based …………….....  Non degree-Based ……..…. | □  □٭ |
| **Level of Study** | | Undergraduate ………..……  Master …………………..……...  PhD ………………………..…….  Post Doc …………………..…..  Specialty ………………..…….  Subspecialty …………………  Fellowship ……………..……..  Short term Course ………… | □  ٭□  □٭  □  □  □  □  □ |
| **School** | | Medicine Mashhad | |
| **Department** | | Physiology | |
| **Major/ Name of Program** | | Drug microinjection by Stereotax instrument in brain regions involved in cardiovascular regulation | |
| **Keywords (3 Words)** | | Microinjection. blood pressure , CNS | |
| **Language Requirement** | | Persian, English | |
| **Admission Requirement** | |  | |
| **Contact Information** | | Phone :05138002230 | |
| Fax :05138828564 | |
| Mobile :09153219304 | |
| Email :shafeimn@mums.ac.ir | |
| Address : Department of Physiology, School of Medicine, Mashhad University of Medical Science, Mashhad, Iran | |
| Contact Person Name :Dr. Mohammad Naser Shafei | |
| **Description (500 words)** | | The brain controls activities of the whole body through a complex network of nerve systems. Hence, there are a great number of Functional centers in the brain. These areas may communicate with each other to control and modulate different somatic functions such as circulation, respiration, digestion, and locomotion .In order to study neuronal pathways associated with these different functions, investigators created a way through which a specific brain region, such as nucleus or fasciculus, can be targeted. These specific regions can be stimulated and recorded, lesioned, and injected with tracers, or chemicals such as agonists, antagonists or neurotoxic substances. A stereotaxic delivery system is utilized in this method, which consists of a stereotaxic instrument and a brain atlas.  The stereotaxic instrument has a frame baseplate with tooth bar and ear bars to mount animal and a railroad for moving a stereotaxic modulator on which a delivery pipette holder is attached. The holder can hold either an electrode or Hamilton syringe. In this technique, small volumes of drug solution are directly injected into specific brain regions. The microinjection technique as used in our laboratory is intended to administer small volumes of drug solution directly into specific brain regions involved in cardiovascular regulation. The following equipments are required for microinjection:  1- Stereotaxic instrument: it is used for advanced the injection cannula in the selected nucleus/or area in brain animal according to atlas of Paxinos and Watson.  2- The injection cannulas are constructed from single barreled micropipette with 35–45 mm internal diameter.  3. Polyethylene catheter (PE-50) for cannulation of femoral artery.  4-power lab system for recording of cardiovascular responses. | |
| **Complete Description** | |  | |
| **Program Detail** | | 1- Anesthetized of animals with urethane  2-Cannulation of trachea was to ease ventilation  3- Cannulat ion of femoral artery with polyethylene catheter (PE-50) filled with heparinized saline  4- Connection of catheter to a pressure transducer recording of arterial pressure and heart rate continuously  5- placing animals in a stereotaxic apparatus  6- Drill a small hole in the skull over the nucleus according to atlas of Paxinos and Watson  7- Microinjection of drugs (agonist or/and antagonist of a receptor of a neurotransmitter) in the nucleus and recording of blood pressure and heart rate  8- Verification site of injection | |