



## **Free Stem Cell Therapy and Long-term Management (up to 3 years) in a Clinical Trial for Qualifying Cats With Chronic Kidney Disease**

### **Study Name:**

The use of selective autologous adipose mesenchymal **Stem Cell Delivery** (MSC) in **cats** with IRIS Stage 3 **Chronic Kidney Disease**

### **Study population:**

Cats with naturally occurring IRIS Stage 3 (Creatinine 2.9-5.0 mg/dL) Chronic Kidney Disease.

### **Disease or Condition:**

Feline Chronic Kidney Disease

### **What is the purpose of this study?**

The ultimate goal of this study is to investigate the safety and efficacy of the administration of autologous adipose derived mesenchymal stem cells (MSC) to aid in the enhancement of renal function by their regenerative capabilities, with the ultimate goal of improving survival in cats with chronic kidney disease.

### **Why is this clinical study being done?**

- 35% of cats will ultimately develop chronic kidney disease which is the leading cause of death in older cats.
- There are no current therapeutic options for cats with CKD other than renal transplantation, of which is not typically an option for most owners. Most of our efforts aim at improving uremic signs with food, dietary supplements, and antacids, but there are no current methods for improving the function of the kidney directly.
- Stem cells are thought to improve, repair, and aid in the growth of damaged tissue through various mechanisms. Since renal failure is so common in cats and renal cell death is the ultimate result, improving the health and environment of the cells that remain could improve the overall function of the kidneys and ultimately improve the survival times and quality of life in these patients. The aim is to use the cat's own adipose derived stem cells to improve renal function directly.

- Stem cells can be delivered in various ways and research has shown that intravenous injection results in first pass delivery of the stem cells to be highest in the pulmonary capillary beds. If the cells are directly delivered into the renal artery then the first capillary bed to uptake the stem cells are the glomeruli and tubular vascular endothelial cells of the nephron, resulting in more dramatic uptake and regenerative capabilities.

### **Study Aims**

1) to perform a pilot study on 6 cats with IRIS stage III CKD using intra-arterial autologous MSC delivery into the renal artery to assess for short term safety and efficacy.

2) if phase 1 proves safe and effective over a 3 month period then the second aim is to investigate and compare the effect of autologous MSC injected via either the renal artery or cephalic (or saphenous) vein on CKD progression in a placebo controlled study (an additional 24 cats).

The authors hypothesize that MSC therapy coupled with conventional therapy will 1) improve renal function based on GFR studies, 2) reduce the mortality from renal failure, 3) reduce all cause mortality, and 4) improve quality of life compared with cats treated only by conventional therapy. In addition, MSC therapy delivered via renal arterial injection prolongs survival compared with cats receiving MSC through peripheral venous injection.

### **Financial Benefits to Participate in This Study for Cats Who Qualify (Phase I)**

- Free stem cell harvesting, isolation, and intra-arterial injection
- Free follow-up for **3 years** (on an every 3 months basis) after stem cell delivery including all examinations, blood work, urinalysis, urine cultures, blood pressures, radiographs, ultrasounds, and GFR studies.
- Each cat in Phase I will have approximately \$14,000 of treatment and diagnostics covered over this 3 year period.

### Potential Health Benefits

- The potential benefits of stem cells in the kidney of cats with CKD include: renal regeneration, anti-fibrotic effects, a decrease in proteinuria and an improvement in the GFR.
- Each patient will be carefully managed over the course of 3 years by a boarded internist with expertise in Feline Renal Disease (AB or CL).

### **Which cat is eligible to participate?**

- Feline patients diagnosed with CKD that have had no other experimental therapies.
- Patients must be in IRIS Stage 3 CKD (Creatinine level 2.9-5.0 mg/dL (either proteinuric or hypertensive is acceptable)
- All patients must have a full workup (see below)
- All patients must have a negative urine culture. Patients can be enrolled once a positive culture becomes negative and there is a full 6 week course of antibiotics given
- No patient can have a current or previous history of urinary tract stone disease

- There can be no known comorbidities other than CKD (i.e. the presence of concurrent, unrelated disease [endocrine, hepatic/biliary, pancreatic, gastrointestinal, neurologic, neoplasia, dermatologic, orthopedic, cardiac, etc])
- If a patient has a heart murmur an echocardiogram will need to be done to rule out feline cardiomyopathy (HCM, RCM, FOCM, DCM, etc).
- All patients must have signed owner consent for participation in this study
- All patients must follow the maintenance treatment protocol established by Drs. Berent and Langston without any other supplements
- All patients must follow medical recommendations by Dr. Berent or Dr. Langston during the study period (3 years after stem cell therapy).

**Each patient will need the following tests prior to inclusion to be considered candidates for this study:**

- |                                                    |                                  |
|----------------------------------------------------|----------------------------------|
| • Complete history (by Dr. Berent or Dr. Langston) | • FeLV/FIV test                  |
| • Diet history                                     | • Urinalysis                     |
| • PE (including fundic exam)                       | • Toxoplasma titers              |
| • Body weight measurement                          | • Urine protein:creatinine ratio |
| • Body conditioning scoring (1-9)                  | • Bacterial urine culture        |
| • Hemogram                                         | • Blood pressure test (Doppler)  |
| • Serum chem panel                                 | • Abdominal ultrasound           |
| • Serum total thyroxine assay                      | • Abdominal Radiographs          |

**What is involved in this study?**

- Each enrolled patient will have fat isolated from the ventral SQ or falciform region.
- The fat will be processed and the mesenchymal stromal component (MSC) (which contains the cats own stem cells) will be isolated.
- 2 days later this aliquot will be delivered into the renal artery using interventional radiology techniques in a non-invasive way through the femoral artery and fluoroscopy.
- The patient will stay overnight on intravenous fluid therapy
- A second delivery will occur 7-21 days later
- All scheduled rechecks will be fully funded if performed at the AMC over a 3 year period (approximately once every 3 months).

**Who can I contact for additional information? Call or email:**

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