

## UPSTREAM CYTOKINES

**14 UPSTREAM PROTEINS PRESENT IN MUSE CELLS, BM MSC AND A MSC**

IL17A  
WNT3A  
CXCL8  
IL3  
IL13  
IFNG  
EPO  
EDN1  
IL1A  
IL4  
PRL  
IL1B  
SPP1  
TNF

**2 UPSTREAM PROTEINS PRESENT BM MSC AND A MSC**

TNFSF10  
CSF2

## **29 UPSTREAM PROTEINS PRESENT IN MUSE CELLS AND A MSC**

CSF3  
CNTF  
IL5  
MIF  
CX3CL1  
SCGB1A1  
CSF1  
IL10  
FAM3B  
TNFSF12  
CCL20  
CCL1  
CCL2  
IL22  
WNT1  
CTF1  
SPRED2  
IL24  
PPBP  
WNT5A  
TIMP1  
CXCL12  
IL13  
IL15  
IL2  
IFNB1  
IL11  
IL6  
OSM

## **6 UPSTREAM PROTEINS PRESENT IN A MSC**

CCL25  
IL17F  
IL19  
CCL18  
IL32  
NAMPT

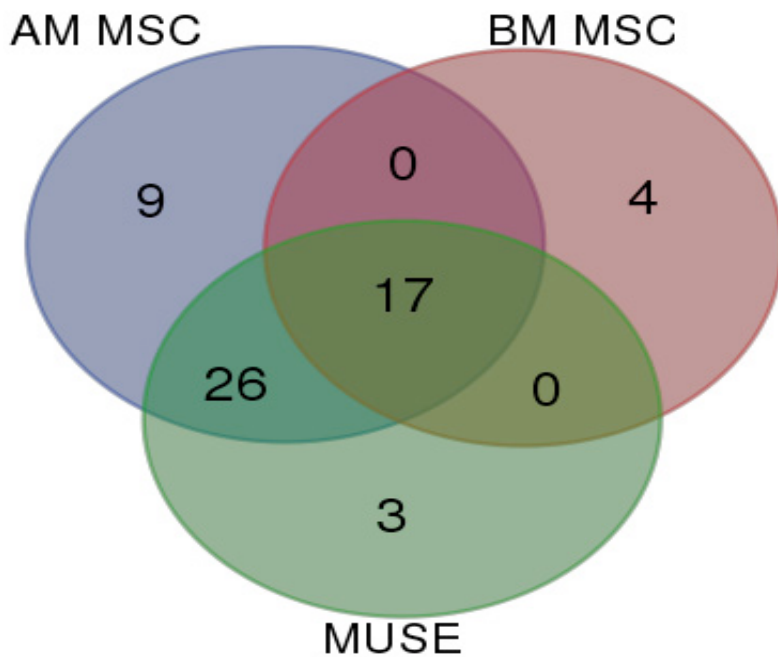
## **4 UPSTREAM PROTEINS PRESENT IN BM MSC**

CCL11  
DKK3  
CD40LG  
CKLF

## **7 UPSTREAM PROTEINS PRESENT IN MUSE CELLS**

IL23A  
CRH  
IL17C  
IFNA2  
TSLP

CXCL16  
LIF



## UPSTREAM GROWTH FACTORS

**17 UPSTREAM PROTEINS PRESENT IN MUSE CELLS, BM MSC AND A MSC**

GDF9  
VEGFA  
BDNF  
AGT  
TGFB3  
TGFB1  
CLEC11A  
EGF  
FGF1  
IGF1  
TGFB2  
NRG1  
FGF2  
BMP2  
TGFA  
CTGF  
INHA

**26 UPSTREAM PROTEINS PRESENT IN MUSE CELLS AND A MSC**

GDF5  
NOV  
HDGF

PDGFC  
GDF2  
GDNF  
GDF10  
INHBA  
BMP6  
GH1  
FGF3  
JAG1  
IGF2  
DKK1  
ANGPTL3  
FGF10  
ANGPT2  
FGF8  
HGF  
PDGFB  
FGF16  
INHBB  
LEP  
WISP2  
BMP7  
KITLG

## **9 UPSTREAM PROTEINS PRESENT A MSC**

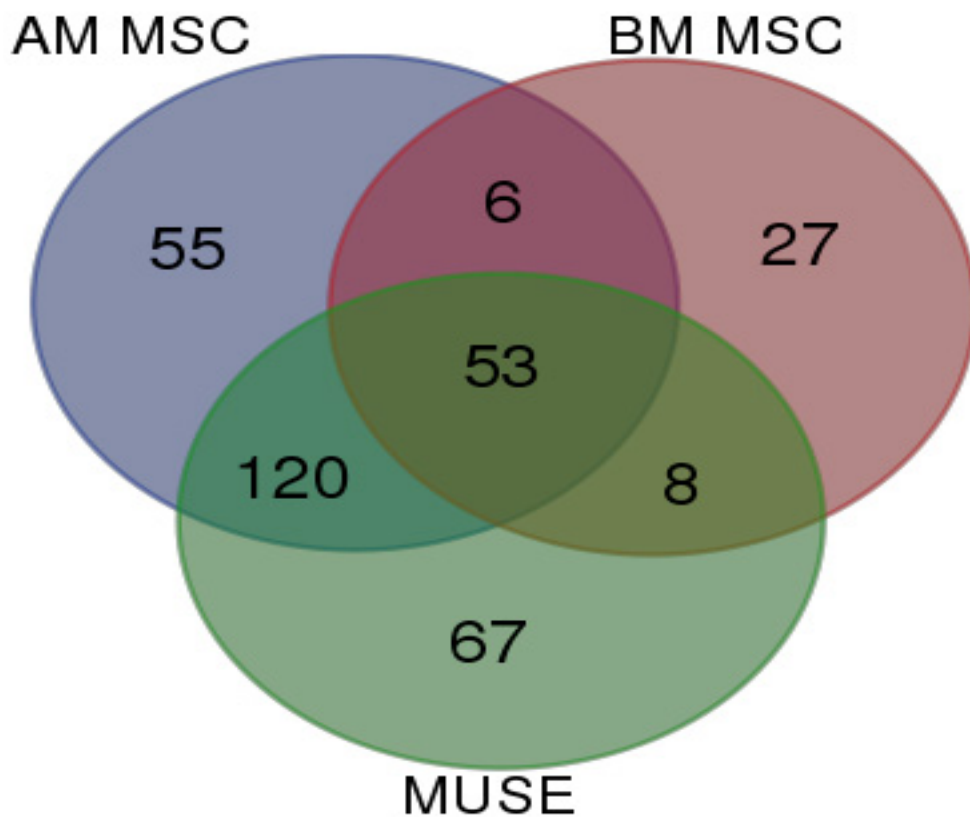
AREG  
MSTN  
PGF  
BMP15  
NGF  
LEFTY2  
FGF21  
NTF4  
INHBC

## **4 UPSTREAM PROTEINS PRESENT IN BM MSC**

ANGPT1  
PROK1  
NOG  
FIGF

## **3 UPSTREAM PROTEINS PRESENT IN MUSE CELLS**

BMP4  
AMELX  
FGF18



## UPSTREAM TRANSCRIPTION FACTORS

**53 UPSTREAM PROTEINS PRESENT IN MUSE CELLS, BM MSC AND A MSC**

YY1  
MEF2D  
NEUROG1  
WT1  
SNAI1  
SIM1  
TP53  
SMAD2  
PML  
SOX4  
SMAD7  
KLF2  
ETV5  
MECP2  
SP100  
STAT3  
SMAD3  
PAX3  
CUX1  
YAP1  
CTNNB1  
FOXM1  
HTT  
FOS

FLI1  
SREBF1  
SMARCA4  
EPAS1  
HTATIP2  
SPDEF  
TAF4  
SMAD4  
CDKN2A  
MYC  
JUN  
E2F1  
ETS1  
MYCN  
TWIST1  
ATF4  
HNF4A  
HIF1A  
TP73  
SRF  
VHL  
MYOCD  
MTPN  
RUNX2  
TRIM24  
NFE2L2  
ARNT2  
HEXIM1  
MYB

## **6 UPSTREAM PROTEINS PRESENT IN BM MSC AND A MSC**

ERG  
JMY  
SKIL  
DDIT3  
STAT4  
SUPT16H

## **120 UPSTREAM PROTEINS PRESENT IN MUSE CELLS AND A MSC**

CREB3L1  
TWIST2  
YBX1  
SRSF2  
TFEC  
HOXD3  
ATF6  
ATF6B  
SP3  
NFYC  
PPARGC1A  
NCOA3  
POU2F3

GLI2  
EHF  
FOSL2  
EP300  
MITF  
HOXB8  
HNF1A  
JUND  
RFX5  
CARM1  
HLTF  
WWTR1  
NSD1  
HNF1B  
USF2  
GTF2I  
RFX1  
CALR  
TSC22D1  
HOXA10  
ONECUT1  
BRCA1  
PIAS4  
SIM2  
NFATC4  
HAND2  
ETV4  
GLI1  
NFYB  
ID4  
DACH1  
NFIX  
TBX5  
POU5F1  
HDAC10  
FOXP3  
MDM2  
NFKB1  
FOSB  
CBL  
SP1  
ZNF148  
HOXD10  
CCND1  
GATA6  
HOXC8  
FOXA1  
MKX  
PDX1  
TGFB1I1  
NACA  
FOXA2  
ARNT  
ZBTB7B  
NFKBIA  
JUNB  
SMARCB1  
ID1  
ELF3  
TBP  
STAT6



DLX1  
CEBPB  
APBB1  
DNAJB6  
HMGA1  
MED13  
ZNF24  
SIX4  
NOTCH3  
PPARGC1B  
PLAGL2  
NFE2L1  
HOXA7  
NKX2-1  
ARID5B  
GLIS2  
Yap1  
NOTCH1  
FOXO1  
RELA  
FOSL1  
LPXN  
SIN3B  
RUNX1  
SATB1  
RB1  
SOX2  
TP63  
GATA4  
EGR1  
NFYA  
FBXW7  
XBP1  
ING2  
CEBPA  
TFAP2A  
HDAC6  
USF1  
SF1  
RFX2  
MEF2C  
MAFB  
KLF6  
KLF4  
MYOD1  
HDAC3

## **8 UPSTREAM PROTEINS PRESENT IN MUSE CELLS AND BM MSC**

IRF4  
BRCA2  
SMAD1  
MKL1  
SNAI2  
STAT1  
HMGB2  
PRDM1

## 55 UPSTREAM PROTEINS PRESENT IN A MSC

VDR  
ACTN4  
ZNF143  
CREB3L2  
HOXB5  
TAF4B  
CEBPD  
CITED2  
PURB  
ZIC1  
MED4  
SOX12  
NAT8  
CBFB  
MED24  
ZNF384  
SOX3  
TFAM  
SMARCD1  
TFE3  
NAB2  
ELK1  
TCF20  
GMNN  
ATF3  
RBM39  
RBM14  
BMI1  
NOC2L  
EZH2  
HES6  
CREB1  
PKNX1  
PRDM16  
SHOX2  
PLAG1  
TCEB1  
KLF10  
TFAP2C  
ELK3  
NFIC  
HSF2  
ETV1  
KEAP1  
SP2  
ETS2  
DAXX  
SMAD6  
HSF1  
NFATC2  
PBX1  
SOX1  
BATF3  
ALYREF  
MECOM

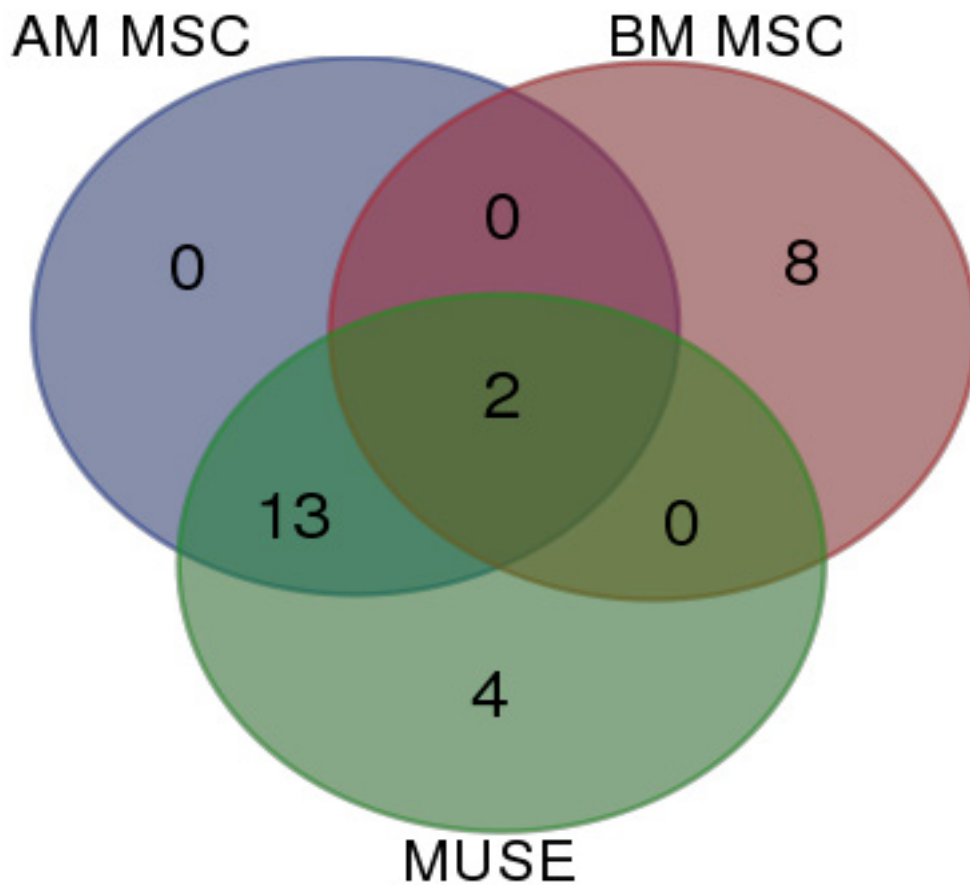
## 27 UPSTREAM PROTEINS PRESENT IN BM MSC

NACC1  
AFF4  
SUB1  
WWC1  
FOXC2  
FOXN3  
IRX4  
ATN1  
ZFHX3  
HNRNPK  
SALL2  
SMARCA2  
POU2AF1  
DEK  
TEAD3  
MEOX2  
MED1  
VAV2  
EPC1  
PFDN5  
TSG101  
SOX15  
PSMD10  
MYBL2  
STAT5A  
FUBP1  
TEAD4

## 67 UPSTREAM PROTEINS PRESENT IN MUSE CELLS

SMARCD3  
DMRT1  
GLIS1  
SOX7  
Esrra  
BACH1  
SOX9  
NFE2  
REL  
CTBP2  
ZFP36  
ZEB1  
HOXC13  
RELB  
DRAP1  
ZNF496  
CREBBP  
PAX1  
GATA3  
FHL2  
HMG1  
ZNF219  
KLF7  
NKX2-8  
HR

FOXK2  
THOC1  
SOX5  
TFEB  
SPI1  
HDAC1  
T  
LMX1B  
CNOT7  
TFAP4  
TIAL1  
NKX3-1  
ZNF282  
E2F4  
AIRE  
RFXAP  
BCL11A  
CEBPZ  
MAFK  
POU2F1  
KAT5  
BCL6  
KLF5  
BARX2  
NKX3-2  
NCOR1  
TSC22D3  
MKL2  
HDAC2  
CEBPE  
CIITA  
RFXANK  
Foxe3  
FOXA3  
KAT2B  
HOXA9  
ZEB2  
DLX4  
MTA1  
ERF  
TADA3  
SOX6



## UPSTREAM MIRNAS

**2 UPSTREAM MIRNAS PRESENT IN MUSE CELLS, BM MSC AND A MSC**

mir-122  
mir-133

**13 UPSTREAM MIRNAS PRESENT IN MUSE CELLS AND A MSC**

mir-375  
mir-183  
mir-196  
mir-96  
mir-143  
mir-1  
mir-29  
mir-155  
mir-663  
mir-24  
mir-21  
mir-145  
mir-138

## **8 UPSTREAM MIRNAS PRESENT IN BM MSC**

mir-144  
mir-135  
mir-224  
mir-128  
mir-30  
mir-142  
mir-124  
mir-451

## **4 UPSTREAM MIRNAS PRESENT IN MUSE CELLS**

mir-146  
let-7  
mir-182  
mir-140