Dataset on transcriptional profiles and the developmental characteristics of PDGFRα expressing lung fibroblasts

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ABSTRACT

The following data are derived from key stages of acinar lung development and define the developmental role of lung interstitial fibroblasts expressing platelet-derived growth factor alpha (PDGFRα). This dataset is related to the research article entitled “Temporal, spatial, and phenotypical changes of PDGFRα expressing fibroblasts during late lung development” (Endale et al., 2017) [1]. At E16.5 (canalicular), E18.5 (saccular), P7 (early alveolar) and P28 (late alveolar), PDGFRαGFP mice, in conjunction with immunohistochemical markers, were utilized to define the spatio-temporal relationship of PDGFRα+ fibroblasts to endothelial, stromal and epithelial cells in both the proximal and distal acinar lung. Complimentary analysis with flow cytometry was employed to determine changes in cellular proliferation, define lipofibroblast and myofibroblast populations via the presence of intracellular lipid or alpha smooth muscle actin (αSMA), and evaluate the...
expression of CD34, CD29, and Sca-1. Finally, PDGFRα⁺ cells isolated at each stage of acinar lung development were subjected to RNA-Seq analysis, data was subjected to Bayesian timeline analysis and transcriptional factor promoter enrichment analysis.

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Specifications Table

| Subject area                  | Developmental Biology |
|-------------------------------|-----------------------|
| More specific subject area    | Lung Development      |
| Type of data                  | Table, image, text file, graph, figure |
| How data was acquired         | 3D Confocal Microscope inverted A1Rsi (Nikon Instruments, Melville, NY), fluorescent activated sorting flow cytometry (LSR II, BD Bioscience), MACS microbeads (Miltenyi Biotec technology, Gladbach, Germany), RNA-Seq (Illumina Inc. San Diego, CA, USA). |
| Data format                   | Filtered, analyzed    |
| Experimental factors          | Samples were not pretreated |
| Experimental features         | The transcriptional profile, temporal, spatial and functional roles of PDGFα⁺GFP expressing fibroblasts were examined at different stages of acinar lung development using RNA-Seq, confocal microscopy and flow cytometry, respectively. |
| Data source location          | Cincinnati, OH 45229, USA |
| Data accessibility            | Data is incorporated with this article |
|                               | Data is accessible at: https://research.cchmc.org/pbge/lunggens/mainportal.html |

1. Data

The data presented herein are representative of the key stages of acinar lung development and define the developmental role of lung interstitial fibroblasts expressing platelet-derived growth factor alpha (PDGFα). Cells expressing PDGFα were analyzed at E16.5, E18.5, P7 and P28. The spatio-temporal localization of PDGFα⁺GFP E18.5 at (Fig. 1) demonstrates the relationship of PDGFα⁺ fibroblasts to proximal and distal saccular lung structures. Flow cytometry using direct flow cytometry of whole-lung single cell suspension preparation and selection by differential adherence in tissue culture to enrich and analyze PDGFα⁺ fibroblast populations is presented in Fig. 2. PDGFα⁺GFP expression was assessed at E16.5, P7, and P28 for GFPdim and GFPbright sub-populations. For the two distinct sub-populations present at P7, the relative abundance of myofibroblasts (αSMA⁺) and lipofibroblasts (LipidTOX⁺) within each population is presented (Fig. 3). Fig. 4 shows data on temporal changes in neutral lipid, αSMA, proliferation, and cell surface expression of CD34, CD29, and Sca-1 in CD326⁺, CD31⁺, CD140⁺ and CD140aneg stromal cells. The gene expression profile from RNA-Seq data provides information in cell-cycle gene changes of isolated PDGFα⁺ fibroblasts throughout acinar lung development (Fig. 5 and Table 1), individual genes upregulated at E18.5 in PDGFα⁺ fibroblasts (Table 2), and changes in contractile gene expression in PDGFα⁺ fibroblasts (Table 3).
Additionally, data from computational transcription factor binding site analyses (Table 4), ChIP-Seq enrichment profiles (Table 5), and promoter sequences of individual genes dynamically expressed by PDGFRα⁺ fibroblasts during acinar lung development. The three transcription factors identified by ChIP-Seq analysis are presented in Table 6.

2. Experimental design, materials and methods

2.1. Animals

B6.129S4-PDGFRα<sup>tm11(EGFP)Sor</sup> mouse-line herein designated PDGFRα<sub>GFP</sub> [2], with PDGFRα promoter driving the expression of the H2B-eGFP fusion gene were used for immunohistochemical, differential plate-down, and flow cytometry analyses. Mice lacking the PDGFRα GFP tag were used for PDGFRα⁺ cell RNA-Seq analysis.

2.2. Confocal microscopy

Lung tissues were harvested, fixed with 4% PFA in PBS and frozen. Tissue was sectioned into 200 μm slices and stained with anti-αSMA (Sigma-Aldrich, St. Louis, MO), Pro-SPC and chicken polyclonal anti-GFP antibody (Abcam, Cambridge, MA). Data was analyzed by Imaris software, version 7.6.

2.3. Characterization of PDGFRα<sub>GFP</sub> Cells by flow cytometry in plate-adhered or suspension cells

Lung tissue from PDGFRα<sub>GFP</sub> mice was harvested, processed into single cell suspension as previously described [3]. Cells were incubated in Dulbecco’s DMEM/F12 (10% FBS, 2% pen/strep) after 2 h of culture, the media containing the non-adherent cell fraction was collected, and the adherent

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**Fig. 1.** Spatial distribution of PDGFRα<sub>GFP</sub> cells during the saccular stage of development. Confocal microscopy of lung sections from E18.5 PDGFRα<sub>GFP</sub> mouse lungs co-stained with αSMA and pro-SPC to demonstrate the relationship of PDGFRα<sub>GFP</sub> cells to saccular epithelial cells and contribution to αSMA-containing developing conducting airways (A) and blood vessels (B). Images obtained with 40X objective.
fraction was collected using Accutase (1 × ACCUTASE enzymes in Dulbecco’s PBS (0.2 g/L KCl, 0.2 g/L KH₂PO₄, 8 g/L NaCl, and 1.15 g/L Na₂HPO₄) containing 0.5 mM EDTA - 4Na and 3 mg/L Phenol Red).

2.4. Bioinformatics data analysis

RNA-Seq data was quantitated using TopHat and Cufflinks [4], genes were included with the expression level (FPKM) was more than 1 in all samples. Bayesian Analysis of Time Series (BATS)
identified genes as differentially expressed at one or more timepoints, co-regulated genes were identified by using pattern recognition using STEM and grouped into Gene expression profiles. Gene expression profiles were subjected to gene set enrichment analysis with Toppgene and Toppcluster [5–7].

2.5. Transcription factor promoter enrichment analysis

Transcription factor promoter enrichment analysis of PDGFRα+ fibroblast RNA-Seq profiles identified three candidate transcription factors: NRSF/REST, CTCF, and MAX. ChIP-Seq has been performed in the following mouse cell lines, and the data available in the public domain:

MAX: http://www.ncbi.nlm.nih.gov/geo/query/acc.cgi?acc=GSM912908
CTCF: http://www.ncbi.nlm.nih.gov/geo/query/acc.cgi?acc=GSM918744
NRSF/REST: https://www.encodeproject.org/experiments/ENCSR000AIS/
Fig. 4. Temporal profiles of proliferation, neutral lipid, αSMA and surface marker expressions of CD45<sup>+</sup>, CD326<sup>+</sup>, CD31<sup>+</sup>, CD140a<sup>+</sup> stromal and CD140a<sup>neg</sup> stromal cell lineages. Proliferation, αSMA, lipid, CD29, CD34 and Sca-1 expressions of CD45<sup>+</sup> hematopoietic (A), CD31<sup>+</sup> endothelial (B), CD326<sup>+</sup> epithelial (C), CD140a<sup>+</sup> stromal (D) or CD140a<sup>-</sup> stromal (E) cells at E16.5 (canalicular), E18.5 (saccular), P7 (early alveolar), P21 (mid alveolar), and P28 (late alveolar) stages of acinar lung development. Data is presented as the relative percentage of cells within each individual cell lineage.

Fig. 5. Transcriptional profile of cell cycle genes expressed in PDGFR<sub>α</sub><sup>+</sup> fibroblasts throughout critical stages of acinar lung development. Expression profile obtained by Bayesian and STEM analysis of RNA-Seq data to identify cell cycle genes that are differentially expressed in PDGFR<sub>α</sub><sup>+</sup> fibroblasts between E16.5, E18.5, P7, and P28 during acinar lung development.
Table 1
Cell cycle genes that are differentially expressed in PDGFrα− fibroblasts during distinct stages of acinar lung development.

| Gene          | E16   | E18    | PN7     | PN28    |
|---------------|-------|--------|---------|---------|
| Calm2         | -0.00571762 | -0.870833 | 1.40198 | -0.525428 |
| Dusp1         | -0.621371 | -0.627324 | -0.2244 | 1.47309 |
| Pmp22         | -0.742166 | -0.979494 | 0.796882 | 0.922978 |
| Sptbn1        | -0.789379 | -0.936042 | 0.940708 | 0.784713 |
| Srsf5         | 0.236167  | -1.08452 | 1.26328  | -0.414932 |
| Hsp90aa1      | 1.41313    | -0.874767 | -0.484744 | -0.0536168 |
| Rhob          | -0.135108  | 1.06733  | 1.34942  | -0.146979 |
| Tub5b         | 0.832279   | -0.958058 | 0.894011 | -0.768232 |
| Thbs1         | 0.872403   | 0.828917  | -0.622006 | 1.07931  |
| Gna2         | -0.147148  | 1.03287  | 1.36953  | -0.18952 |
| Jun           | -0.851524  | -0.510853 | -0.055664 | 1.41804  |
| Anapc13       | 1.1925    | -0.897243 | -0.751497 | 0.456244 |
| Gnb21l        | 1.40582    | -0.040552 | -0.47046 | -0.89481 |
| Stmn1         | 0.934956   | -1.09228 | 0.757047 | -0.599728 |
| Smc1a         | 0.883569   | -1.00734  | 0.835485  | -0.711719 |
| Tubala        | -0.354266  | -0.839746 | 1.45038  | -0.256367 |
| Pcna          | 1.26778    | -0.642412 | 0.313621  | -0.938985 |
| Rhob          | -0.535957  | -1.11043  | 0.573782  | 1.0726 |
| Ywlah         | 0.729312   | -1.24987 | 0.880943 | -0.360389 |
| Calm1         | 0.056566   | -1.42903  | 0.766416  | 0.606044 |
| Mapre2        | -0.362037  | -0.86111  | 1.41818  | -0.216867 |
| Sept2         | -0.191729  | -0.869314 | 1.43734  | -0.37692 |
| Pfk2          | -0.294531  | -0.643503 | 1.47699  | -0.718961 |
| Rad21         | 0.830549   | -1.05783  | 0.876974  | -0.649691 |
| Txnip         | -1.04578   | -0.321895 | 0.025266 | 1.34242 |
| Cdk4          | 1.21118    | -0.889579 | 0.426562  | -0.74816 |
| Trp53         | 0.304485   | -1.02912  | 1.25272  | -0.528087 |
| Ube2c         | 1.31111    | -0.750289 | 0.249112  | -0.809935 |
| Sept4         | -0.884936  | -0.73429  | 0.381385  | 1.23784 |
| Mapk3         | -0.467964  | -1.05953  | 1.25962  | 0.267868 |
| Chd4          | 0.965382   | -1.06658  | 0.73079  | -0.629589 |
| Csnk1a1       | 0.145345   | -0.458397 | 1.32271  | -1.00946 |
| Sept11        | -0.38547   | -0.834781 | 1.32797  | -0.788659 |
| Cetn3         | 0.920627   | -1.39894  | 0.440421  | 0.0378935 |
| Nsnc2         | 0.927752   | -1.12649  | 0.751502  | -0.552767 |
| Ppp1cc        | 0.757517   | -0.691919 | 0.562431  | -0.758029 |
| Ppp1ca        | 0.769955   | -1.19987  | 0.876423  | -0.446511 |
| Smc4          | 1.16898    | -0.798464 | 0.49566  | -0.866176 |
| Ppp1cb        | -0.197778  | -1.11343  | 1.31193  | -0.0007138 |
| Smc3          | 1.1891     | -1.10388  | 0.422153  | -0.571375 |
| Csk1b         | 1.34665    | -0.629637 | 0.15774  | -0.874757 |
| Sept7         | -0.183509  | -0.878618 | 1.43392  | -0.371793 |
| Mrk67         | 1.18879    | -0.728754 | 0.459143  | -0.919178 |
| Spin1         | 0.10549    | -0.943386 | 1.35379  | -0.515895 |
| Top2a         | 1.20696    | -0.806017 | 0.43718  | -0.838125 |
| Tubb4b        | 0.286298   | -1.44805  | 0.310388  | 0.851369 |
| Kmt2e         | 0.0343548  | -1.37276  | 0.999874  | 0.33853 |
| Rgs2          | -0.0296069 | 1.39706   | -0.446672 | -0.920779 |
| Son           | 0.19415    | -1.31686  | 1.01841  | 0.0145653 |
| Gna13         | 0.490256   | -1.24935  | 1.05433  | -0.295233 |
| Cdkn1c        | 1.41418    | -0.105178 | -0.397307 | -0.911693 |
| Usp9a         | 0.0760878  | -1.4367   | 0.72769  | 0.632917 |
| Zak           | -0.700217  | -1.01532  | 0.918107  | 0.797432 |
| Ier3          | 0.980432   | 0.73242   | -0.723419 | -0.989433 |
| Wapal         | 0.632021   | -1.23307  | 0.971144  | -0.370096 |
| Anapc5        | 0.682133   | -1.37308  | 0.798597  | -0.10765 |
| Ppm1g         | 0.965661   | -1.34965  | 0.485437  | -0.101447 |
| Spec1l        | -0.56199   | -0.715791 | -0.184349 | 1.46213 |
| Nedd9         | -0.579639  | -1.04244  | 1.17282  | 0.449265 |
| Ube2i         | 0.696443   | -1.44155  | 0.654793  | 0.0903107 |
Table 1 (continued)

| Gene    | E16       | E18       | PN7       | PN28       |
|---------|-----------|-----------|-----------|------------|
| Sirt2   | −0.128286 | −1.19834  | 1.24105   | 0.0855696  |
| Usp47   | 0.972221  | −1.25556  | 0.60976   | −0.326424  |
| Nasp    | 1.35164   | −0.650695 | 0.151524  | −0.85247   |
| Ccar1   | 1.19936   | −0.883878 | 0.448599  | −0.789176  |
| Lats2   | −0.50131  | −1.12181  | 1.10564   | 0.517486   |
| Ccny    | 0.0769666 | −1.09766  | 1.30669   | −0.285998  |
| Calm3   | 0.207701  | −1.12116  | 1.25756   | −0.344101  |
| Eid1    | −0.207967 | −0.932492 | 1.4784    | −0.277739  |
| Foxn3   | −0.353993 | −1.18568  | 1.14637   | 0.393299   |
| Mts1    | −0.231669 | −1.04971  | 1.35605   | −0.0746687 |
| Usp8    | 0.0653615 | −1.32136  | 0.147907  | 1.10809    |
| Ran     | 1.27067   | −0.982225 | 0.291102  | −0.579552  |
| Cdc123  | 0.684283  | −1.30701  | 0.872431  | −0.249708  |
| Ccnt1   | 0.350793  | −1.48693  | 0.669501  | 0.466636   |
| Ppp6c   | −0.0845592| −1.25198  | 1.18414   | 0.152397   |
| Dynlt3  | −0.662532 | −1.02528  | 1.05067   | 0.637141   |
| Smarca4 | 0.897716  | −0.966186 | 0.827408  | −0.758938  |
| Pafah1b1| −0.0028538| −1.05804  | 1.34217   | −0.281278  |
| Trp53tp2| 0.0115787 | −1.34168  | 1.06203   | 0.268075   |
| Marveld1| −0.809342 | −0.848667 | 1.18272   | 0.475286   |
| Ccndbp1 | −0.23958  | −1.27197  | 1.0577    | 0.453849   |
| Ccpg1   | −0.647646 | −0.929798 | 0.302994  | 1.27445    |
| Cdx6    | 0.385309  | −0.958141 | 1.22701   | −0.654178  |
| Crgf    | −0.476914 | −1.05691  | 0.277427  | 1.2564     |
| Khdrbs1 | 0.834267  | −0.819312 | 0.89601   | −0.911146  |
| Arl8b   | 0.352736  | −1.40768  | 0.34949   | 0.768457   |
| Nduc    | 1.41244   | −0.834935 | −0.023113 | −0.554394  |
| Anxa1   | −0.049034 | −0.778171 | −0.598799 | 1.426      |
| Nipbl   | 0.583539  | −1.21221  | 1.01876   | −0.390092  |
| Stag1   | 0.412112  | −1.08482  | 1.18106   | −0.508359  |
| Junb    | 0.410953  | 1.17702   | −1.09807  | −0.489902  |
| Cdk11b  | 0.0832877 | −1.20526  | 1.2359    | −0.113924  |
| Cast    | −0.2003   | −1.33032  | 0.668522  | 0.862097   |
| Klh9    | 0.406837  | −1.35494  | 0.998055  | −0.0499484 |
| Ctcf    | 0.823152  | −1.16313  | 0.845177  | −0.505199  |
| Uspl6   | 0.280098  | −1.43447  | 0.891483  | 0.262886   |
| Pcp4    | 0.473111  | −1.22507  | 0.999318  | −0.147358  |
| Brcd7   | 0.444032  | −1.490762 | 0.47713   | 0.576461   |
| Cdkn1a  | 0.091628  | 0.462374  | −1.4225   | 0.868503   |
| Cdc5l   | 1.1105    | −1.1579   | 0.483718  | −0.436864  |
| Psme3   | 1.21813   | −1.16459  | 0.254701  | −0.30825   |
| Ckap5   | 0.976807  | −0.964173 | 0.740723  | −0.753357  |
| Setd8   | 0.947553  | −1.26396  | 0.634908  | −0.318502  |
| Erh     | 1.03215   | −1.0091   | 0.665275  | −0.688322  |
| Sept9   | 0.555875  | −0.684408 | 1.11649   | −0.987952  |
| Gas6    | −0.610436 | −0.642252 | −0.219312 | 1.472      |
| Yeats4  | 1.06306   | −1.19386  | 0.532339  | −0.401537  |
| Rabl    | 0.445575  | −0.909659 | 1.19804   | 0.733953   |
| Hcfc1   | 1.0087    | −1.15647  | 0.636994  | 0.489225   |
| H2afx   | 1.36257   | −0.760365 | 0.137039  | −0.73924   |
| Ccnd2   | −0.26808  | −0.727408 | 1.47332   | −0.477836  |
| Mapr1   | 0.403968  | −0.845579 | 1.22686   | −0.78525   |
| Ep300   | 0.310167  | −1.46051  | 0.341653  | 0.80869    |
| Tacc1   | −0.582128 | −0.859333 | 0.0559869 | 1.38547    |
| Gene        | E16   | E18   | PN7   | PN28  |
|-------------|-------|-------|-------|-------|
| ADAMTS1     | -1.0996 | 1.89932 | -0.778615 | 0.109199 |
| HBA-A1      | -0.72184 | 1.89803 | -0.602954 | -0.736058 |
| HBB-BT      | -0.698284 | 1.89715 | -0.648254 | -0.725893 |
| OLFR62      | -0.658434 | 1.89326 | -0.719626 | -0.719626 |
| HBB-B1      | -0.701052 | 1.8915 | -0.598885 | -0.7459 |
| ENPP2       | -0.696722 | 1.89078 | -0.611701 | -0.668638 |
| GM17644     | -0.743782 | 1.88918 | -0.860528 | -0.196981 |
| 4930470H14Rik| -1.12671 | 1.88433 | -0.794499 | 0.185705 |
| LARS2       | -0.712029 | 1.88186 | -0.874364 | -0.206367 |
| PENK        | -0.697763 | 1.8681 | -0.466888 | -0.81606 |
| PROS1       | -1.42972 | 1.85069 | -0.092791 | -0.456466 |
| MT1         | -0.547424 | 1.82338 | -0.993104 | -0.15854 |
| GM10052     | -0.166882 | 1.70856 | -0.893127 | -0.893127 |
| TGFBR3      | -1.64478 | 1.69903 | -0.353873 | 0.405727 |
| HBB-Y       | -0.127185 | 1.68753 | -0.892553 | -0.910755 |
| TRIB1       | -0.115112 | 1.65209 | -1.06878 | -0.363624 |
| RGS2        | -0.070595 | 1.59547 | -0.557646 | -1.11311 |
| ALDH2       | -0.916657 | 1.55663 | -1.19667 | 0.944171 |
| NDRG2       | -0.78057 | 1.55655 | -1.26841 | 0.882676 |
| ODC1        | -0.038573 | 1.55499 | -0.483119 | -1.21095 |
| HHIP        | 0.188624 | 1.48161 | -0.840506 | -0.864842 |
| SPRED1      | -0.149031 | 1.45532 | -0.070748 | -1.56369 |
| ZFP36       | 0.226683 | 1.45129 | -1.11433 | -0.463834 |
| BC170900    | 0.303844 | 1.42934 | -1.00008 | -1.00008 |
| HBA-X       | 0.373835 | 1.37937 | -1.01109 | -1.01109 |
| MYC         | 0.149769 | 1.35186 | -0.277893 | -0.49285 |
| SNORA52     | 0.415108 | 1.34884 | -1.01697 | -1.01697 |
| RMRP        | 0.351773 | 1.29452 | -1.3491 | -0.068137 |
| MAFF        | 0.437803 | 1.28682 | -0.755838 | -0.10525 |
| JUNB        | 0.463468 | 1.27891 | -1.14282 | -0.495453 |
| IGF1P6      | 0.246262 | 1.27624 | -0.268592 | -1.53017 |
| CCDC3       | -1.24372 | 1.25611 | 0.861579 | -1.34577 |
| 1500012f01Rik| 0.45529 | 1.25174 | -0.659759 | -1.17327 |
| BHLHE40     | 0.544517 | 1.19043 | -1.25119 | -0.321188 |
| FAU         | 0.622948 | 1.15584 | -0.922513 | -0.886115 |
| Btg2        | 0.612911 | 1.11406 | -1.25966 | -0.320921 |
| HSPB1       | -0.866681 | 1.1016 | -1.24201 | 1.53001 |
| RPPH1       | -0.046067 | 1.05871 | -1.60545 | 1.10589 |
| KLF9        | -1.24071 | 1.04622 | -0.906275 | 1.56238 |
| ATF3        | 0.811023 | 0.98054 | -1.12267 | -0.576751 |
| SOCS3       | 0.870832 | 0.928448 | -1.02609 | -0.729075 |
| ITGAV       | -0.712633 | 0.916735 | 1.02392 | -1.81532 |
| SLC2A1      | 0.891161 | 0.905855 | -1.0727 | -0.655793 |
| THBS1       | 0.900603 | 0.854342 | -0.689139 | -1.17562 |
| IFRD1       | 0.217954 | 0.829998 | -1.65768 | 1.15147 |
| SKIL        | 0.157235 | 0.777133 | 0.584415 | -2.05964 |
| EIF3E       | 0.93836 | 0.777077 | -0.563455 | -1.31203 |
| Hit9        | 1.03277 | 0.774112 | -0.959012 | -1.08616 |
| CCNL1       | 1.02674 | 0.764284 | -0.973248 | -0.792439 |
| IER3        | 1.01516 | 0.75419 | -0.777739 | -1.05766 |
| EEFI1A      | 0.893956 | 0.733123 | -0.340296 | -1.53243 |
| CDK11A      | 0.256919 | 0.726925 | -1.66259 | 1.24179 |
| IGF2        | 1.05441 | 0.725075 | -0.829588 | -1.09723 |
| ELN         | -1.81889 | 0.705691 | 0.891242 | 0.0251241 |
| LOX         | 1.10847 | 0.663704 | -1.10496 | -0.568685 |
| SNORA15     | 1.17483 | 0.621342 | -1.02944 | -1.02944 |
| MMP2        | -0.11503 | 0.562767 | 1.52805 | 1.71138 |
| FMO2        | -1.01789 | 0.561459 | -0.906965 | 1.89521 |
| PTN         | 1.19277 | 0.559803 | -0.808516 | -1.063832 |
| Hes1        | 1.13426 | 0.553428 | -0.544956 | -1.29785 |

Table 2: Genes upregulated in PDGFRα− fibroblasts at E18.5 relative to other stages of acinar lung development.
Table 2 (continued)

| Gene   | E16     | E18     | PN7     | PN28    |
|--------|---------|---------|---------|---------|
| TREM3  | 1.23746 | 0.5435  | −1.02013 | −1.02013 |
| PLAGL1 | 1.11539 | 0.540813 | −0.457605 | −1.38903 |
| SNORA75| 1.24616 | 0.532386 | −1.01866 | −1.01866 |
| GLUL   | −1.67974 | 0.52669 | 0.0790104 | 1.29294 |
| EDNRB  | 1.22549 | 0.501732 | −0.735441 | −1.08308 |

Table 3

Transcriptional profile of contractile genes differentially expressed in PDGFRα⁺ fibroblasts over the course of acinar lung development.

| Gene    | E16     | E18     | PN7     | PN28    |
|---------|---------|---------|---------|---------|
| Sparc   | −0.782064 | −0.884034 | 0.502201 | 1.1639 |
| Npm1    | 1.3844  | −0.154564 | −0.225484 | −1.00435 |
| Sod1    | −0.106237 | −1.29861 | 0.305218 | 1.09963 |
| Vim     | −0.32131 | −0.867333 | 1.44228 | −0.253635 |
| Eln     | −1.43045 | 0.610192 | 0.760175 | 0.0600839 |
| Tpm1    | −0.297888 | −0.0921075 | 1.38385 | −0.993852 |
| Fln1    | 1.07808 | −1.01729 | 0.602467 | −0.663255 |
| Tmsb4x  | 0.783135 | −1.23122 | −0.396606 | 0.844691 |
| Tgfb1   | −0.201384 | 0.321878 | 1.13319 | −1.25368 |
| Fn1     | −0.834609 | −0.825804 | 0.481646 | 1.17877 |
| Myadn   | −0.950365 | −0.74732 | 1.06936 | 0.628329 |
| Gog5    | 0.799333 | −1.39643 | 0.63971 | −0.0426118 |
| Tmsb10  | 0.134493 | −0.868777 | 1.35647 | −0.622189 |
| Fln1    | −0.568048 | −0.828443 | −0.014463 | 1.41095 |
| Rac1    | −0.170999 | −0.967267 | 1.402 | −0.263733 |
| CFl1    | 0.952984 | −0.798067 | 0.771927 | −0.926844 |
| Msn     | −0.353353 | −1.04234 | 1.33608 | 0.0596072 |
| Arpc2   | 0.673331 | −1.25646 | 0.923198 | −0.340072 |
| Fbn1    | −0.745338 | −0.971735 | 0.74445 | 0.972623 |
| Itgb1   | −0.573494 | −0.606145 | 1.48646 | −0.306817 |
| Arf1    | 0.0803654 | −1.29798 | 1.14149 | 0.0761276 |
| Cdh11   | 0.801392 | −1.367 | 0.68846 | −0.122848 |
| Rhoa    | −0.135108 | −1.06733 | 1.34942 | −0.146979 |
| Cald1   | −0.306922 | −0.723712 | 1.47733 | −0.446696 |
| Mmp2    | −0.220158 | 0.299274 | −1.24572 | 1.14003 |
| Myl6    | 0.415826 | −1.29762 | 1.0551 | −0.173303 |
| App     | −0.830414 | −0.877626 | 1.05587 | 0.652173 |
| Ctnnb1  | −0.136582 | −1.31422 | 1.04303 | 0.40777 |
| Gna2    | −0.147148 | −1.03287 | 1.36953 | −0.18952 |
| Cdc42   | 0.368935 | −1.11146 | 1.19372 | −0.451996 |
| Igf1    | 1.34653 | 0.102391 | −0.472771 | −0.976149 |
| Mylk    | 0.0820497 | −0.892443 | 1.37175 | −0.561356 |
| Cav1    | −0.79122 | −0.744583 | 1.38648 | 0.0773188 |
| Flna    | 0.713322 | −1.17997 | 0.936876 | −0.470232 |
| Gnb2l1  | 1.40582 | 0.0405521 | −0.47046 | −0.89481 |
| Tnc     | −0.424942 | −0.295052 | 1.47202 | −0.752022 |
| Tpm3    | 0.592418 | −0.696541 | 1.09092 | −0.986797 |
| Capz8   | 0.642076 | −1.23233 | 0.964042 | −0.373784 |
| Ctnnd1  | −0.483005 | −0.886022 | 1.4072 | −0.031474 |
| Akap2   | −0.574534 | −0.49027 | 1.49745 | −0.432647 |
| Myh10   | 0.222398 | −1.36676 | 1.03463 | 0.109729 |
| Gnb1    | 0.0972075 | −1.15717 | 1.26814 | −0.208171 |
| Hspb1   | −0.718661 | 0.699476 | −0.988926 | 1.00811 |
| F2r     | −0.740158 | −0.912192 | 0.494055 | 1.1673 |
| Ednra   | 1.13125 | −1.15915 | −0.419792 | 0.447694 |
| Gene      | E16  | E18  | PN7  | PN28  |
|----------|------|------|------|-------|
| Rhob     | -0.535957 | -1.11043 | 0.573782 | 1.0726 |
| Sptan1   | -0.603347 | -0.903481 | 1.33841 | 0.168423 |
| Cull3    | 0.560345 | -1.28661 | 0.982377 | -0.256117 |
| Myh11    | 0.459331 | -0.102365 | 0.986597 | -1.343356 |
| Pdlim3   | -0.571051 | 0.0286009 | 1.39505 | -0.852598 |
| Rdx      | -0.197531 | -1.10317 | 1.32045 | -0.0197473 |
| Myh9     | -0.079762 | -0.635777 | 1.43791 | -0.722382 |
| Zyx      | -0.379613 | -1.08824 | 0.188798 | 1.27906 |
| Dstn     | -0.768233 | -0.733085 | 0.140156 | 1.36116 |
| Actr3    | 1.3969 | -0.260784 | -0.977504 | -0.158609 |
| Bmp4     | -0.288633 | -1.28364 | 0.914452 | 0.657823 |
| Cyb5r3   | -0.745596 | -0.907206 | 1.1836 | 0.4692 |
| Cdk4     | 1.21118 | -0.895579 | 0.426562 | -0.74816 |
| AldoA    | 0.826149 | -1.14381 | -0.533523 | 0.85188 |
| CdH5     | -0.650899 | -0.644739 | 1.46062 | -0.164986 |
| Ghr      | 0.275738 | -0.76286 | 1.29793 | -0.810804 |
| Atp2a2   | -0.51177 | -1.14786 | 0.977006 | 0.682622 |
| Ltbp2    | -0.596826 | -0.0823989 | 1.4365 | -0.757278 |
| Ps3      | 0.23697 | -1.20358 | 1.20027 | -0.233664 |
| Cap1     | 0.554204 | -1.36045 | 0.911563 | -0.105319 |
| LimA     | -0.323465 | -1.15467 | 1.22366 | 0.254468 |
| D pys1   | 0.4660809 | 1.101872 | 0.807133 | 0.908401 |
| Ppp1ca   | 0.769955 | 1.19887 | 0.876423 | -0.446511 |
| S100a10  | 0.0334959 | -0.101683 | -0.368988 | 1.35232 |
| Slc9a3r2 | -0.786913 | -0.833294 | 1.24425 | 0.377755 |
| Marck3   | -0.095569 | -0.286677 | 1.38184 | -0.999596 |
| Sorbs3   | -0.673777 | -0.914912 | 1.2671 | 0.32158 |
| Fus      | 0.644405 | -0.755523 | 1.0575 | -0.946377 |
| Gsn      | -0.512083 | -0.503138 | -0.484682 | 1.4999 |
| Nckap1   | -0.301663 | -1.20117 | 1.16187 | 0.340968 |
| Add1     | -0.311211 | -1.218 | 1.11843 | 0.410786 |
| Tgfb2    | -0.717995 | -0.912799 | 0.444436 | 1.21636 |
| C d44    | 0.0409719 | -0.805395 | 1.39648 | -0.632058 |
| Tns3     | -0.464562 | -1.03593 | 0.209286 | 1.29121 |
| Actn1    | 0.458479 | -1.0762 | 1.15762 | -0.539902 |
| Wasf2    | -0.352504 | -1.07925 | 1.30154 | 0.130213 |
| Dcl1     | -0.741294 | -0.187926 | 1.23701 | 0.383594 |
| Rlap1gap | -0.481962 | -0.533931 | -0.483672 | 1.49556 |
| Dnajb6   | 1.06517 | -1.34927 | 0.185953 | 0.9045508 |
| Lcp1     | 1.41617 | -0.90207 | -0.101197 | -0.412904 |
| Cdknc1c  | 1.41418 | -0.105178 | -0.397307 | -0.911693 |
| Sdc4     | -0.63846 | -0.381346 | -0.471663 | 1.49147 |
| Tmod3    | -0.38887 | -1.17516 | 1.13201 | 0.431829 |
| Net1     | -0.145783 | -0.07899 | 1.32632 | -1.10154 |
| Iqgap1   | -0.257395 | -1.23511 | 0.362558 | 1.12995 |
| Kank2    | -0.552174 | -1.12744 | 0.921746 | 0.757869 |
| Pecam1   | -0.675754 | -0.620807 | 1.45989 | -0.163329 |
| Slk      | -0.082074 | -0.947722 | 1.39944 | -0.369648 |
| Speccl1  | -0.56199 | -0.715791 | -0.184349 | 1.46213 |
| Rock2    | -0.752439 | -0.893999 | 1.449575 | 1.19686 |
| Afl2     | 0.761761 | 0.925637 | -1.07558 | -0.579823 |
| Actn4    | -0.441928 | -1.03076 | 1.30985 | 0.162832 |
| Myol1b   | -0.595032 | -1.09886 | 0.890657 | 0.803232 |
| Cxcl12   | -0.377019 | -0.839748 | 1.44875 | -0.23198 |
| Vcam1    | -0.118534 | -0.76449 | -0.561394 | 1.44442 |
| Chchd2   | 1.12552 | -1.04178 | 0.525748 | -0.609493 |
| Arhgef12 | -0.728362 | -0.801487 | 1.33803 | 0.191823 |
| Bcl2     | 0.69956 | 0.36696 | 0.471325 | 1.483384 |
| Cryab    | -0.831001 | -0.825524 | 0.470555 | 1.18597 |

Table 3 (continued)
| Gene     | E16     | E18     | PN7    | PN28    |
|----------|---------|---------|--------|---------|
| Tpm2     | 0.35849 | -0.0645877 | 1.0411 | -1.33536 |
| Stat3    | -0.951892 | -0.420543 | -0.012086 | 1.38452 |
| Capza1   | 0.945866 | -0.94505 | 0.778122 | -0.778938 |
| Il1b     | 1.47332 | -0.225586 | -0.622641 | -0.625097 |
| Rnd3     | 1.34749 | -0.576498 | 0.14145 | -0.912138 |
| Slit2    | -0.72262 | -0.638973 | -0.075036 | 1.43663 |
| Dnm2     | -0.296382 | -1.16068 | 1.23026 | 0.226806 |
| Emp2     | -0.964067 | -0.678616 | 0.460195 | 1.18249 |
| Marcksl1 | 1.2413 | -0.274669 | 0.193641 | -1.16027 |
| Myc      | 0.184816 | 1.20839 | -0.179336 | 1.21387 |
| Mif      | 1.49932 | -0.52861 | -0.458383 | -0.512332 |
| Fnbp1    | 0.540304 | -1.46099 | 0.733985 | 0.186696 |
| Clec2d   | -0.773785 | -0.863032 | 0.420383 | 1.21643 |
| Crh      | 1.228 | 0.402804 | -0.815403 | -1.21387 |
| Smarca4  | 0.897716 | -0.966186 | 0.827408 | -0.758938 |
| Rhej     | -0.69625 | -0.652373 | 1.44251 | 0.0938585 |
| Palld    | -0.057783 | 0.00800809 | 1.24686 | 1.19891 |
| Pafah1b1 | -0.002853 | -1.05804 | 1.34217 | -0.281278 |
| Pik3r1   | -0.845334 | -0.292798 | -0.311845 | 1.44998 |
| Fblim1   | -0.364685 | -1.24792 | 0.737608 | 0.875 |
| Cdk6     | 0.385309 | -0.958141 | 1.22701 | 0.654178 |
| Ctgf     | -0.476914 | -1.05691 | 0.277427 | 1.2564 |
| Slpr1    | -0.673846 | -0.700603 | 1.43239 | 0.0579363 |
| Shc1     | 1.07814 | -0.51254 | 0.558318 | 1.12392 |
| Coro1b   | 0.085574 | -1.32288 | 1.10712 | 0.130185 |
| Mapk14   | -0.241958 | 1.28682 | -1.13058 | 0.0857137 |
| Junb     | 0.410953 | 1.17702 | -1.09807 | -0.489002 |
| Mprip    | -0.666687 | -1.02581 | 1.03463 | 0.657863 |
| Rock1    | 0.158822 | -1.39264 | 0.987159 | 0.246661 |
| Hax1     | 0.684126 | -1.47716 | 0.263223 | 0.529807 |
| Akap13   | 0.0260559 | -1.15889 | -0.09462 | 1.25829 |
| Gng12    | -0.35838 | -1.00589 | 1.36373 | 0.00354535 |
| Cdkn1a   | 0.0916268 | 0.462374 | -1.4225 | 0.868503 |
| Gna13    | -0.44997 | -0.936124 | 1.38607 | 2.05e-05 |
| Gnaq     | -0.091048 | -1.03193 | 1.36656 | -0.243584 |
| Sept9    | 0.555875 | -0.684408 | 1.11649 | -0.987952 |
| Gna12    | -0.300922 | -0.871765 | 1.44129 | -0.268605 |
| Sh3pdx2a | -0.403176 | -0.808365 | 1.45726 | -0.245722 |
| Prnp     | -1.32794 | 0.522858 | -0.162763 | 0.967841 |
| Dab2     | 1.12043 | -1.10753 | -0.515332 | 0.502433 |
| Mapre1   | 0.403968 | -0.845579 | 1.22686 | -0.78525 |
| Fat1     | 0.727381 | 0.507463 | 0.234335 | 1.46918 |
| Clec7a   | 1.49561 | -0.390523 | -0.549357 | 1.055734 |
Table 4
Computational transcriptional factor binding site motif enrichment analyzed in the differential gene expression pattern of six profiles.

| Profile | Gene/TF | – log Pval |
|---------|---------|------------|
| Profile_1 | KLF3 | 29.92 |
| Profile_1 | ELK3 | 29.31 |
| Profile_1 | YBX1 | 19.67 |
| Profile_1 | SP1 | 19.52 |
| Profile_1 | HBP1 | 12.97 |
| Profile_1 | FOXF2 | 6.998 |
| Profile_1 | ID3 | 6.854 |
| Profile_1 | CUX1 | 3.526 |
| Profile_1 | CTCF | 2.103 |
| Profile_13 | KLF6 | 28.86 |
| Profile_13 | ELK4 | 13.64 |
| Profile_13 | SMARCC2 | 6.029 |
| Profile_13 | NFE2L1 | 4.113 |
| Profile_13 | NFIA | 3.98 |
| Profile_13 | NFIX | 3.98 |
| Profile_13 | MEF2A | 3.491 |
| Profile_13 | MAX | 2.221 |
| Profile_13 | FOXN3 | 3.203 |
| Profile_10 | RUNX3 | 4.56 |
| Profile_10 | JUNB | 4.264 |
| Profile_18 | KL7 | 5.862 |
| Profile_23 | FO5B | 4.769 |
| Profile_39 | KL4 | 36.43 |

Table 5
Previously published ChIP-Seq data with significant overlap of genes differentially expressed in CD140+ fibroblasts throughout lung development.

| Profile | Track | Cell | TF | Overlap | Total | Ratio | Enrichment | p-Val |
|---------|-------|------|----|---------|-------|-------|------------|-------|
| Profile_1 | Caltech_Tfbs | C2C12 | NRSF | 207 | 465 | 0.45 | 3.41 | 5.80E – 66 |
| Profile_1 | Licr_Chip | MEL | CTCF | 286 | 465 | 0.62 | 2.22 | 4.26E – 46 |
| Profile_13 | Sydh_Tfbs | CH12 | Max | 193 | 257 | 0.75 | 2.17 | 1.62E – 37 |

Table 6
Genes identified in the ChIP-Seq enrichment analysis and differentially expressed in CD140+ cells.

| CTCTF & NRSF | NRSF | CTCF | MAX |
|--------------|------|------|-----|
| ACTN1 | ANAPC5 | 1110004F10R | 1700016K19R |
| ACTR2 | AP2M1 | 170002014R | ACA2 |
| ANXA6 | ATP5B | 2700081015R | ACO2 |
| AP5B1 | ATP6VOC-P52 | 6820431F20R | ACTN4 |
| AP5 | BRD2 | AAT1 | ADD1 |
| ARPC1B | CALD1 | ADNP | ADIPOR1 |
| ARPC2 | CALU | ANKR11 | AHCY1L |
| ARPC5 | CBX3 | ANKR17 | AKAP12 |
| ATP5C1 | CDK11B | ANP32A | ANO6 |
| B230219D22R | CFD1 | ATF7IP | AP2B1 |
| BCLA1 | CNN3 | ATP5J | ARF4 |
| CALM2 | CX1L12 | ATXN2L | ARHGAP1 |
| CALM3 | DDX1 | BAZ1B | ARHGDIA |
| CANX | DDX3X | BC05537 | ARL8B |
| CAPRIN1 | DHX15 | BPTF | ASAH1 |
| CAPZ2A1 | DLD | BZW1 | ATL3 |
Table 6 (continued)

| CTCF & NRSF | NRSF | CTCF | MAX |
|------------|------|------|-----|
| CAPZA2     | EIF5 | CCND2 | ATP1A1 |
| CAPZB      | FKBP10 | CCNI | ATP1B3 |
| CCNY       | FOXF2 | CDC123 | ATP2A2 |
| CDC42      | FSTL1 | CDK6 | ATP6AP1 |
| CFL1       | FZD1 | CDV3 | ATP6V0D1 |
| CHD4       | GSK3B | CLINT1 | ATP6V0E |
| CKA4       | GTF2A2 | CNN2 | ATP6V1A |
| COMMD3     | GTF3C6 | CNOT1 | BAG1 |
| COP5S      | HDAC2 | COP2Z2 | BAG6 |
| CORO1C     | HNRNPH1 | CPD | BCAPI3 |
| CSNK1A1    | IDH3B | CRTAP | BRD7 |
| CUL3       | IMMT | CTCF | CALM1 |
| CYC1       | ITSN2 | CTDNEP1 | CAPNS1 |
| DDX39B     | KTN1 | CTDSP1 | CAST |
| DEND5A     | LGALS1 | CUL1 | CCDC47 |
| DHX9       | MDH2 | CUX1 | CCNDBP1 |
| EID1       | NARS | CXNC1 | CCNT1 |
| EIF3C      | NCO1 | DD1 | CD164 |
| EIF3D      | NDUF10 | DNAJCI0 | CD47 |
| EIF4G2     | NRD1 | DNAJC7 | CHMP2A |
| EIF5B      | NSMCE2 | DNMT3A | CHTOP |
| EPB41L2    | NXX1 | DNTTIP2 | CIR1 |
| ERH        | PCNP | EIF2X3 | CLIP1 |
| EWSR1      | POMP | EIF3G | CLN5 |
| FBXO11     | PP4R2 | EIF4A3 | COPA |
| FKBP1A     | PRCP | EIF4G3 | COPE |
| FLNA       | PRDX2 | ELK3 | COPG1 |
| FUS        | PSMB5 | ERBB2IP | CR1L |
| GDI2       | RCN2 | ESF1 | CRIPT |
| GHR        | ROHA | EXT2 | CSNK1G2 |
| GLUD1      | RNF4 | FAM120A | CTDSP2 |
| GNB1       | RTN4 | FAM193A | CTNNB1 |
| H3F3A      | SDCBP | GALNT1 | CTS |
| HMG13       | SETD5 | GIN54 | CTSB |
| HMOM2      | SLC25A3 | GNG12 | CTSD |
| HNRNPA0    | SND1 | GNG5 | CUTF |
| HNRNP2B1   | SNRP200 | GOLGA7 | DAP |
| HNRNPDL    | SNRP70 | GPBP1 | DAZAP2 |
| HPRT       | STRAP | GSK3A | DCTN4 |
| HTATSF1    | TAF13 | GTPBP4 | DCTN6 |
| ID3        | TRP53 | H1FO | DDOST |
| IK         | TUBB6 | HDGF | DEGS1 |
| ILF3       | VDAC3 | HIC1 | DHR51 |
| IVNS1ABP   | VIM | HIPK2 | DNAJ1 |
| KANSL1     | YBX1 | HMGN1 | DNAJB1 |
| KHDRB51    | YEATS4 | HNRNPA3 | DPP8 |
| KLF3       | ZFP207 | HNRNPH2 | EGLN1 |
| KPNB1      | HNRNPL | ERF4EBF2 |
| LE01       | HNRNPU1L | EIF4ENFI |
| LRRC59     | ILK | ILK | ELF4 |
| LSM14A     | KLCD2 | ELOVL5 |
| MBD2       | KTLH9 | EMC3 |
| MFSD1      | LARP4B | EMC4 |
| MSL1       | LASP1 | EMC7 |
| MYH9       | LIX1 | EP300 |
| NCBP2      | LSM12 | ERGIC3 |
| NDUF1A2    | MAP4 | ERPI9 |
| NEDD4      | MAP7D1 | ESYT1 |
| NUP62      | MAPK1IP1 | EFA |
| P4HB       | MAPKAP1 | FADS1 |
| PABPC1     | MAPRE1 | FAM114A1 |
## Table 6 (continued)

| CTCF & NRSF | NRSF | CTCF | MAX |
|-------------|------|------|-----|
| PAICS       | MAPRE2| FBXO22|
| PCBP1       | MIDN | GANAB|
| PCBP2       | MRFAP1| GM13363|
| PPFN1       | MTDH | GM6644|
| PNRC2       | MTSS1L| GOLGA4|
| POLR2A      | NDUF52| GORASP2|
| PPI1CC      | NONO | GRN|
| PPI1R12A    | NRBP1| GTF2B|
| PPP3R1      | NUCKS1| H2-K1|
| PRELID1     | PABPN1| HADHA|
| PRKAR1A     | PAPOLA| HADHB|
| PRPF40A     | PCM1 | HAX1|
| PRPF4B      | PDCD5| HDLBP|
| PRRC2A      | PDS5A| HECTD1|
| PSMD11      | PICALM| HIAT1|
| PSMD12      | PTPNA| HIPK1|
| PSMD6       | POLR2M| HRNRNPUL2|
| PTBP1       | PPP1CA| HSP90B1|
| PTP4A2      | PSMA7| IFITM2|
| PTPN12      | PSMC2| IFT20|
| QK          | PSMD1| IQGAP1|
| RAB10       | PTBP3| IRF2BP2|
| RAB14       | PTCH1| ITPG1|
| RAB6A       | PTOV1| JAGN1|
| RAC1        | PUM2 | KCMF1|
| RNF187      | RAD21| KDELRE|
| RNF7        | RAP1A| KIF1B|
| SCAF11      | RBBP6| KLF6|
| SENP6       | RERE | KMT2E|
| SH3BGR1L3   | REST | KRCC1|
| SH3GLB1     | RRPI | LAMP1|
| SLTM        | SETD8| LAMTOR5|
| SMC6        | SHFM1| LGALS9|
| SRP72       | SHOC2| LIMA1|
| SRRM1       | SKAP2| LIMS1|
| SRSF2       | SKIV2L2| LMAN1|
| SRSF3       | SLK | MAPK1|
| SRSF5       | SMARCA4| MAT2A|
| SSR3        | SMARCE1| MAX|
| STAG1       | SMO | MEF2A|
| STMN1       | SNAI2| MLF2|
| STX12       | SNHG5| MYL12A|
| SUPT16      | SNX4 | NBR1|
| TAB2        | SP1  | NCOA4|
| TBL1X       | SPIN1| NCSTN|
| TCF12       | SUCLG2| NDIFP1|
| TFG         | SYNGRIP| NFE2L1|
| THRAP3      | TCEA1| NFIX|
| TEMD9       | THOC7| NISCH|
| TEMM123     | GTMM22| OC1AD1|
| TEMM131     | TPR | PAPA1B2|
| TEMEM234    | TSPAN3| PDHB|
| TEMPO       | UBE2E3| PDA4|
| TOPIB       | UBE2I| PDZD11|
| TRIP12      | UBE2V1| PHLD1A|
| TTC3        | UBE4B| PXNB2|
| TUBA1A      | USP47| PPP2R1A|
| TUBB5       | UTP3 | PTP1|
| VAMP3       | VCP | P5MC5|
| VDAC2       | WAPAL| PTPRS|
| WDR1        | WDR26| RAB1|
| CTCF & NRSF | CTCF        | MAX       |
|------------|-------------|-----------|
| XRN2       | YWHAB       | RAB7      |
| YTHDC1     | ZC3H15      | RAB9      |
| YWHAE      | ZFP664      | RANBP9    |
| YWHAH      | ZMYND11     | RAP2A     |
| YWHAQ      | RCN1        | REEP5     |
| ZCRB1      | RTNH1       | RHOB      |
|            | RTN3        | RNN1      |
|            | S100A11     | RTN3      |
|            | SAR1A       | SAR1B     |
|            | SEC. 31A    | SEC. 63   |
|            | SEC. 61A1   | SERINC1   |
|            | SEC. 63     | SIRT2     |
|            | SMDT1       | SMDT1     |
|            | SNAPIN      | SMDT1     |
|            | SRRP        | SMDT1     |
|            | STAU1       | SMDT1     |
|            | STT3A       | SMDT1     |
|            | STT3B       | SMDT1     |
|            | STX4A       | SMDT1     |
|            | STX5A       | SMDT1     |
|            | SUPT6       | SMDT1     |
|            | SW15        | SMDT1     |
|            | TAGLN1      | SMDT1     |
|            | TAO1K1      | SMDT1     |
|            | TCF25       | SMDT1     |
|            | TECR        | SMDT1     |
|            | TLN1        | SMDT1     |
|            | TM9SF2      | SMDT1     |
|            | TM8IM6      | SMDT1     |
|            | TMED10      | SMDT1     |
|            | TMED2       | SMDT1     |
|            | TMOD3       | SMDT1     |
|            | TOR1AIP2    | SMDT1     |
|            | TRAPPCG5B   | SMDT1     |
|            | TRP53BP2    | SMDT1     |
|            | TUBB4B      | SMDT1     |
|            | TXNDC5      | SMDT1     |
|            | UBR5        | SMDT1     |
|            | UBXN4       | SMDT1     |
|            | UGP2        | SMDT1     |
|            | USP16       | SMDT1     |
|            | USP8        | SMDT1     |
|            | VGLL4       | SMDT1     |
|            | VPS25       | SMDT1     |
|            | VPS28       | SMDT1     |
|            | YWHAH       | SMDT1     |
|            | ZFP106      | SMDT1     |
|            | ZMIZ1       | SMDT1     |
|            | ZYX         | SMDT1     |
To identify potential candidate genes in PDGFRα⁺ fibroblasts regulated by NRSF/REST, CTCF, or MAX during acinar lung development, we cross-referenced the dynamically regulated genes identified by our present RNA-Seq analysis with the above, previously-published gene sets [1].

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